Conceptual Alternatives Study

Opportunity Corridor
Cuyahoga County, OH

Submitted to:

Ohio Department of Transportation
5500 Transportation Blvd
Garfield Heights, Ohio 44125

Submitted by:

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October 2010

CLEVELAND OPPORTUNITY CORRIDOR
OHIO DEPARTMENT OF TRANSPORTATION

Conceptual Alternatives Study
CUY-Opportunity Corridor Study, PID 77333
Cuyahoga County, Ohio

Prepared for

The Ohio Department of Transportation, District 12
5500 Transportation Blvd
Garfield Heights, Ohio 44125

Prepared by

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October 2010

Opportunity Corridor Study
Conceptual Alternatives Study
Executive Summary

Introduction and Purpose of Report
The Opportunity Corridor Conceptual Alternatives Study report, submitted as part of Step 5 of the Ohio Department of Transportation (ODOT) Project Development Process (PDP), identifies the recommended conceptual alternatives to be further studied in Step 6 of the PDP. As part of the process for identifying and selecting conceptual alternatives, this report discusses the results of engineering, traffic, and environmental studies completed to develop and evaluate conceptual alternatives.

Over the past 50 years, various concepts of an extension of I-490 to points east have been proposed by Cuyahoga County, the City of Cleveland, and private interests. Projects such as the Clark Avenue Freeway in the 1950s and the Bedford Freeway in the 1960s looked at providing new east-west connections in the project study area. Each of these concepts included extending the freeway east from where it currently ends at I-490 and E. 55th Street. However, due to strong neighborhood opposition and lack of funding, these concepts were never implemented.

In 2000, ODOT began a study of Cleveland's Innerbelt, which includes I-71 from SR 176, and I-90 through Downtown Cleveland to SR 2. The Innerbelt Study was commissioned to develop a strategy for the renewal of the downtown transportation infrastructure. The infrastructure (bridge decks and roadway pavements) of the Innerbelt Freeway was approaching the end of its useful life. In conducting this study, concepts were developed as a way to shift some of the traffic from the Innerbelt Bridge to other networks either during construction or as permanent alternate routes so that the new bridges would not have to be designed to carry as much traffic. In early 2001, this project received comments from University Circle workers living west and south of the CBD who advocated for a connection from I-490 to their work location. They did not want to travel through the CBD via the Innerbelt (a circuitous route) to reach University Circle. These comments prompted ODOT to initiate the Opportunity Corridor Study, then known as the University Circle Access Boulevard (UCAB), to evaluate the transportation merits of such a connection.

Purpose and Need
The purpose of the Opportunity Corridor project is to create the transportation infrastructure to improve mobility and access in southeast Cleveland and support the revival and redevelopment of large tracts of vacant industrial and residential land within an area bounded by Cedar Avenue on the north, E. 55th Street on the west, Woodhill Road/E. 93rd Street on the east, and Union Avenue on the south. The manufacturing economy of these lands historically relied upon the rail transportation corridors within the area. By the mid 20th century, the economy had evolved such that trucking had replaced rail as the primary mover of industrial goods. Adjacent to this area are I-490 and I-77 to the west and the University Circle area, Cleveland's second largest employment center, to the northeast. Within the defined area, the local street grid is missing an east-west arterial between Woodland and Union Avenues, and a north-south arterial between E. 55th Street and E. 93rd Street/Woodhill Road. Said gaps are about two miles wide. An improved local street system and improved access to the freeway system could support new development and redevelopment within the area by facilitating truck movement in an area crisscrossed by rail lines which once expedited goods movement but now restricts truck movement. Furthermore the project's proximity to the growing University Circle economy will allow for expansion of the University Circle institutions and associated development that is envisioned by the City of Cleveland.

Alternatives Development
During Steps 1 through 4 of ODOT's PDP, four conceptual alternatives were developed and evaluated using an alternatives screening process that was developed by ODOT in coordination with the City of Cleveland and other identified stakeholders. The proposed boulevard facility would be a multi-lane urban arterial with curbs, an elevated landscape median, multi-modal facilities, landscaping, and lighting. The screening process looked at six screening criteria, including ability to meet purpose and need, impacts to environmental resources, utility relocation issues, right-of-way requirements, structure impacts, and planning-level cost estimates. Using this screening process, the number of conceptual build alternatives was reduced from four to two. The findings and conclusions of PDP Step 4, including the recommendations regarding further study of two conceptual alternatives, were presented to the public through a series of formal public meetings and neighborhood meetings conducted in September 2009.

Step 5 Conceptual Alternatives
As part of the alternatives evaluation completed in Step 5, the study area was divided into three geographic sections (West, Central, and East). Additional engineering alignments were also developed during Step 5 to avoid and minimize impacts to the surrounding community. Using the two conceptual alternatives that were advanced from Step 4 as the starting point, a total of three different alignment alternates (A/B/C) were developed and/or refined within each geographic section. The boundaries of the sections were established such that each alternate within a given section is compatible with those in the adjacent geographic sections. Therefore, any alternate from one geographic section can be combined with any alternate from the other geographic sections. This results in a total of twenty-seven possible options to create a build alternative for the Opportunity Corridor project. A brief description of the alternates within each geographic section is included below.

West Geographic Section
The West Section is located in the Saint Hyacinth neighborhood of Slavic Village and the Kinsman neighborhood between I-77 and E. 75th Street and includes the intersection of E. 55th Street and I-490. The boulevard section would be utilized. Design year traffic capacity analysis requires three through lanes in each direction along the boulevard and turn lanes at select intersecting streets. Modifications to the GCRTA's E. 55th Street transit station would be required. The primary difference between the West Alternates is the proposed intersection configuration between I-490, E. 55th Street, and the proposed boulevard. The following intersection options were developed:

Alternate A – Conventional four-legged, signalized intersection at I-490/E. 55th Street/Proposed Boulevard

Alternate B – Depress I-490 under E. 55th Street and braid a series of ramps west of E. 55th Street to provide access between the freeways and E. 55th Street

Alternate C – Depress I-490 under E. 55th Street and construct quadrant roadway in the vicinity of E. 59th Street to provide full access between E. 55th Street, the freeways, and the proposed boulevard

Central Geographic Section
The Central Section is located in the Kinsman, Buckeye and Fairfax neighborhoods between E. 75th Street and Quincy Avenue. Each of the Central Alternates would adjoin the West Section alternates with a four-legged intersection at E. 75th Street. Each of the alternates would continue in a northeasterly direction until reaching Quincy Avenue. The centerline alignment of each Central Section Alternate varies. A brief description of the Central Section alternates is included below.

Alternate A – Generally, the proposed roadway alignment is the most westerly of the three alternates and is the closest to the NS Nickelplate Line. It would create a new underpass structure to take the proposed boulevard under Norfolk Southern mainline tracks and would create a discontinuity of Woodland Avenue.

Alternate B – The proposed roadway alignment is shifted slightly east from Alternate A. It would create a new underpass structure to take the proposed boulevard under Norfolk Southern mainline tracks, would maintain continuity of existing Woodland Avenue, and would generally run parallel to the GCRTA Red Line trench north of Woodland Avenue.

Alternate C – The proposed roadway alignment is shifted further east than Alternates A and B. It would create a new underpass structure to take the boulevard under Norfolk Southern mainline tracks and would generally run parallel to the elevated CSX Railroad alignment north of Woodland Avenue.

East Geographic Section
The East Section is located along E. 105th Street from Quincy Avenue to Chester Avenue in the Fairfax and University Circle neighborhoods. All of the East alternates would widen E. 105th Street to a 5-lane, undivided typical section with two through lanes in each direction.

Alternate A - The proposed project would widen existing E. 105th Street on its west side from Quincy Avenue to just north of Cedar Avenue. North of Cedar Avenue, the roadway widening would vary along both the east and west side of E. 105th Street through the Chester Avenue intersection. The existing E. 105th Street bridge over GCRTA and NS would be widened.

Alternate B – The proposed project would widen existing E. 105th Street symmetrically along the existing centerline from Quincy Avenue to just north of Cedar Avenue. North of Cedar Avenue, the roadway widening would vary along both the east and west side of E. 105th Street through the Chester Avenue intersection. The existing E. 105th Street bridge over GCRTA and NS would be widened.

Alternate C – The proposed project would widen existing E. 105th Street on its east side from Quincy Avenue to just north of Cedar Avenue. North of Cedar Avenue, the roadway widening would vary along both the east and west side of E. 105th Street through the Chester Avenue intersection. The existing E. 105th Street bridge over GCRTA and NS would be widened.

Evaluation of Alternatives
The comparative evaluation of alternates within each geographic section resulted in the elimination of several alternates, including West Alternate B, Central Alternate C, East Alternate A, and East Alternate B.

The proposed four-legged intersection at I-490/E. 55th Street as part of West Alternate A provides more conventional access to E. 55th Street in comparison to West Alternates B and C. Because it is the lowest cost option and provides the most conventional method of access, it is recommended that West Alternate A be carried forward for further study as part of PDP Step 6. However, as part of the evaluation completed under PDP Step 5, it was determined that design year traffic operations for the at-grade intersection are projected to be substandard. Consequently, additional capacity analyses will be needed to determine if acceptable design year traffic operations can be attained once NOACA refines the future traffic volumes as part of PDP Step 6.

West Alternate B would depress existing I-490 under E. 55th Street just north of the existing I-490/E55th Street intersection with a system of braided ramps west of E. 55th Street. Although this alternate would provide improved access and mobility, access would not be provided between E. 55th Street and the boulevard. The proximity to I-77 would also require eastbound drivers to make multiple traffic decisions in a quick time frame. These items could create driver confusion for drivers looking to access E. 55th Street. Consequently, it is recommended that Alternate B be eliminated from further study due to potential driver expectancy/confusion concerns associated with the E. 55th Street access and a substantial increase in construction costs relative to the other alternates.

Although it has the highest residential impact of the three West Geographic Section alternates, West Alternate C provides the best traffic operations while providing full access to E. 55th Street. Therefore, it is recommended that Alternate C be carried for further study in PDP Step 6 and additional analysis be performed regarding the number of occupied units and the potential for finding available replacement housing within the St. Hyacinth neighborhood for those that may be impacted by this or any of the West Section alternates.

Due to the highest relative impact to Section 4(f) resources (i.e., the planned expansion of the Kenneth Johnson [Woodland] Recreation Center) as well as the great challenges with respect to accommodating the local street network and the existing rail operations, it is recommended that Central Alternate C be eliminated from further study. Alternates A and C are recommended for further study as part of PDP Step 6. As part of Step 6, additional analysis should be completed to better define impacts to Section 4(f) resources (historic and recreational), as well as potential impacts to homes and businesses anticipated with Alternates A and B.

With the exception of structure impacts, all the East Section alternates have similar impacts. Based on the lower impacts to structures, it is recommended that only East Alternate C be carried for further study in PDP Step 6.

Step 5 Recommended Conceptual Alternatives
The comparative analysis led to the recommendation of carrying forward four conceptual build alternatives for additional study in PDP Step 6. The four recommended conceptual build alternatives consist of a combination of build alternate components from each of the three geographic sections (West, Central, and East). Together, the feasible alternates from each geographic section form a complete Opportunity Corridor project from western terminus to eastern terminus. A brief comparative summary of these alternatives is included in **Table ES-1.**

The No Build Alternative is viable and will be carried forward for further study both as a stand-alone alternative and as the basis for comparison with the four recommended conceptual build alternatives.

Table ES-1: Summary of Step 5 Recommended Conceptual Alternatives

Recommended Conceptual Alternative	Geographic Section Combination			Relocations			Traffic Capacity Concerns (LOS)	Env. Justice Impacts	Wetland Impacts	Stream Impacts	Impacts to Threatened/ Endangered Species	Hazardous Material Sites Impacted	NRHP-Listed/ NRHP-Eligible Site Effects	Cleveland Landmarks	Section 4(f) Resource Impacts	Section 6(f) Resource Impacts	Estimated Probable Cost (2010 $'s)
	West	Central	East	Residential	Business	Non-Profit (Church)											
Alternative CA1	A	A	C	71	16	2	Yes	Yes	No	No	No	118	6	3	Yes	No	$190,600,000
Alternative CA2	A	B	C	75	15	2	Yes	Yes	No	No	No	104	7	4	Yes	No	$200,900,000
Alternative CA3	C	A	C	90	16	2	No	Yes	No	No	No	115	6	3	Yes	No	$203,100,000
Alternative CA4	C	B	C	94	15	2	No	Yes	No	No	No	101	7	4	Yes	No	$213,400,000

Note: Table does not include Utility Impact and Geotechnical Concerns since this could not be determined through Step 5 analysis.

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1.0 Introduction

In 2004, the Ohio Department of Transportation (ODOT) retained HNTB to conduct a study to improve access between the Cleveland area Interstate System and University Circle (PID Number 77333). This *Conceptual Alternatives Study* is the culmination of Step 5 of ODOT's Project Development Process (PDP) for the Opportunity Corridor Study. This document was prepared in accordance with the requirements of the 14-Step Project Development Process, as specified in Section 1403.3 of the Ohio Department of Transportation's *Location and Design Manual, Volume 3* and their *Project Development Process Manual*. The purpose of this document is to summarize the evaluation of the conceptual alternatives developed to meet the project purpose and need while minimizing impacts to identified areas of concern such as natural environmental features, cultural resources, and community resources. The information included in this report will be utilized to select a set of feasible alternatives for detailed environmental and design study.

Additional documents prepared for the Opportunity Corridor Study provide supplemental information supporting the conclusions and recommendations contained herein. These documents are listed below and will be available for review at ODOT's District 12 Office upon approval from ODOT Central Office and FHWA.

- *Public Involvement Plan (January, 2005; Currently being updated for activities completed during Step 5, as well as refined approach for Step 6)*
- *Red Flag Summary (October, 2005)*
- *Existing and Future Conditions Report (April, 2006)*
- *Strategic Plan (August, 2006)*
- *Purpose and Need Statement (September, 2008)*
- *Environmental Site Assessment Screening (HzW Environmental Consultants, LLC., November 2009.*
- *Phase I History/Architecture Survey Report (Michael Baker Jr., Inc., January, 2010)*
- *Phase I Archaeological Literature Review (ASC Group, Inc., February 2010)*
- *Air Quality Screening (July, 2010)*
- *Noise Screening (July, 2010)*
- *Relocation Assistance Program Survey (OR Colan Associates, July, 2010)*

Additional technical information, Steering Committee meeting and workshop minutes are also available for review on the study web site www.BuckeyeTraffic.org/OpportunityCorridor.

1.1 Project History

Over the past 50 years, various concepts of an extension of I-490 to points east have been proposed by Cuyahoga County, the City of Cleveland, and private interests. Projects such as the Clark Avenue Freeway in the 1950s and the Bedford Freeway in the 1960s looked at providing new east-west connections in the area. Each of these concepts included extending the freeway east from where it currently ends at I-490 and E. 55th Street. However, due to strong neighborhood opposition and lack of funding, these concepts were never implemented.

In 2000, ODOT began a study of Cleveland's Innerbelt, which includes I-71 from SR 176, and I-90 through Downtown Cleveland to SR 2. The Innerbelt Study was commissioned to develop a strategy for the renewal of the downtown transportation infrastructure. The infrastructure (bridge decks and roadway pavements) of the Innerbelt Freeway was approaching the end of its useful life. In conducting this study, concepts were developed as a way to shift some of the traffic from the Innerbelt Bridge to other networks either during construction or as permanent alternate routes so that the new bridges would not have to be designed to carry as much traffic. In early 2001, this project received comments from University Circle workers living west and south of the CBD who advocated for a connection from I-490 to their work location. They did not want to travel through the CBD via the Innerbelt (a circuitous route) to reach University Circle. These comments prompted ODOT to initiate the Opportunity Corridor Study, then known as the University Circle Access Boulevard (UCAB), to evaluate the transportation merits of such a connection.

As part of the study process, ODOT is working in close coordination with the Greater Cleveland Partnership (GCP) and the City of Cleveland as they work to develop and refine the future land use and economic development vision for southeast Cleveland, including the Opportunity Corridor study area. As part of this collaboration, a 21-member Steering Committee was developed to represent the neighborhood and business interests during the project study process, to encourage public dialogue, and to facilitate input necessary to achieve consensus related to the planning, design, and construction of the project. The Opportunity Corridor Steering Committee is comprised of business, political, and transportation service agency representatives, as well as leaders of Community Development Corporations. The Steering Committee meets periodically and meetings are typically scheduled based on availability of new project information. A listing of the Steering Committee meetings, as well as listing of the various entities, agencies, and organizations with representation on the Steering Committee can be found in Section 4.1 of this report.

1.2 Summary of Purpose and Need

The purpose of the Opportunity Corridor project is to create the transportation infrastructure to improve mobility and access in southeast Cleveland and support the revival and redevelopment of large tracts of vacant industrial and residential land within an area bounded by Cedar Avenue on the north, E. 55th Street on the west, Woodhill Road/E. 93rd Street on the east, and Union Avenue on the south. The manufacturing economy of these lands historically relied upon the rail transportation corridors within the area. By the mid 20th century, the economy had evolved such that trucking had replaced rail as the primary mover of industrial goods. Adjacent to this area are I-490 and I-77 to the west and the University Circle area, Cleveland's second largest employment center, to the northeast. Within the defined area, the local street grid is missing an east-west arterial between Woodland and Union Avenues, and a north-south arterial between E. 55th Street and E. 93rd Street/Woodhill Road. Said gaps are about two miles wide. An improved local street system and improved access to the freeway system could support new development and redevelopment within the area by facilitating truck movement in an area crisscrossed by rail lines which once expedited goods movement but now restricts truck movement. Furthermore the project's proximity to the growing University Circle economy will allow for expansion of the University Circle institutions and associated development that is envisioned by the City of Cleveland. The project's *Purpose and Need Statement* (September, 2008) is available for review at ODOT's District 12 Office.

1.3 Study Area

The study area is generally bounded by the existing railroad transportation corridor containing Greater Cleveland Regional Transit Authority's (GCRTA) Red Line, GCRTA's Blue/Green Line and freight tracks owned and operated by Norfolk Southern Corporation (NS) and CSX Corporation (CSX). It includes portions of the Community Development Corporations (CDC) of Burten Bell Carr, Slavic Village, Fairfax Renaissance, Buckeye Area, and University Circle Incorporated and is located entirely within the City of Cleveland, Ohio. These Community Development Corporations represent the community interests in the following neighborhoods that generally align with the Statistical Planning Areas (SPA) described in later sections of this report.

Table 1-1: Neighborhoods Represented by each Community Development Corporation

CDC	Neighborhood Represented	SPA
Burten Bell Carr Dev. Corp.	Central, Kinsman	Central, Kinsman
Slavic Village Dev. Corp.	Slavic Village (including St. Hyacinth)	North Broadway
Fairfax Ren. Dev. Corp.	Fairfax	Fairfax
Buckeye Area Dev. Corp.	Buckeye	Woodland Hills
University Circle Inc.	University Circle	University

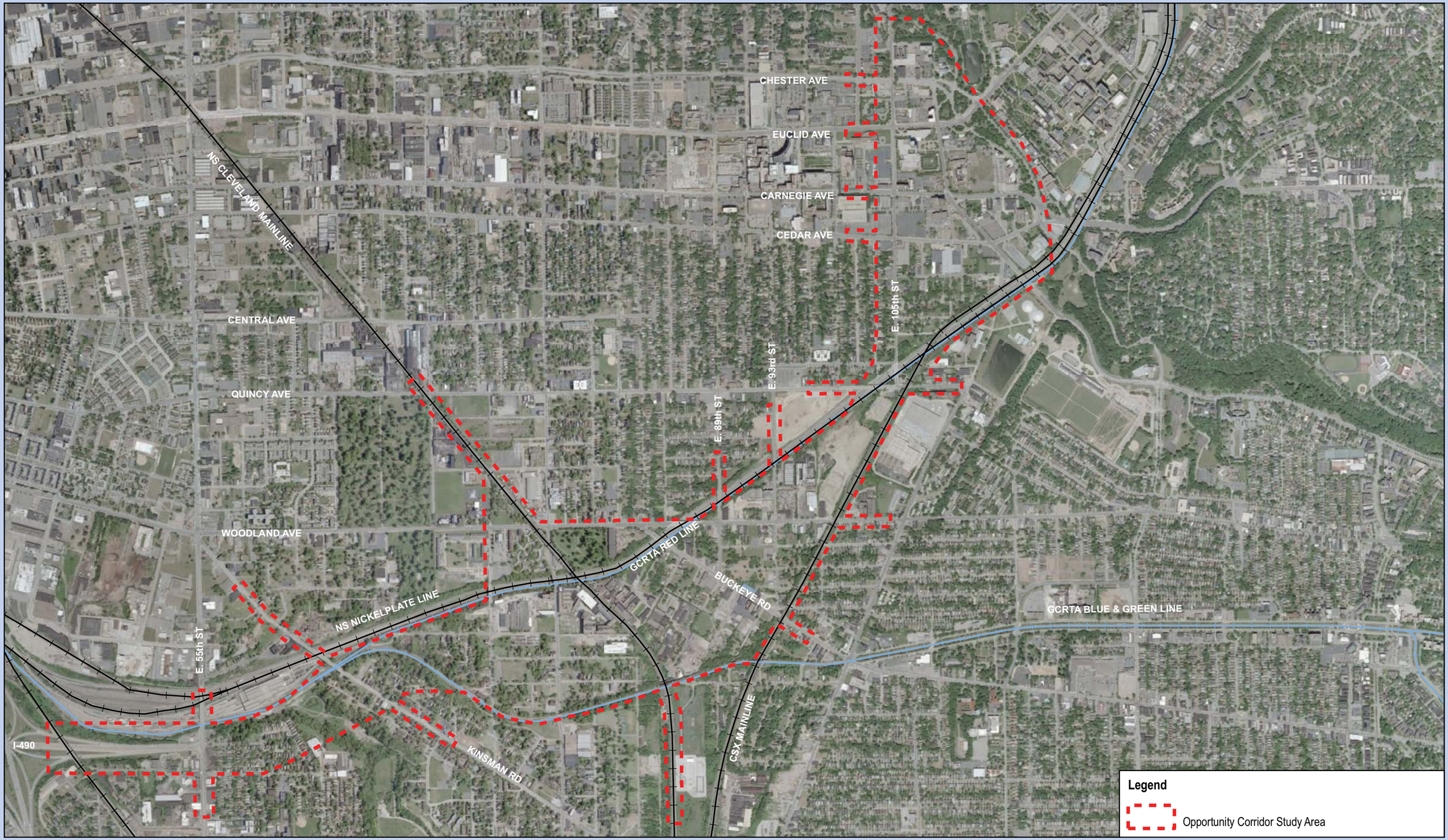
The western study area limits include the I-490 approach to the I-490/E. 55th Street intersection in the Slavic Village area. The eastern study area limits include the E. 105th Street/Chester Avenue intersection in the University Circle area. The study area boundary is shown in **Figure 1-1, page 3**. For purposes of this study, detailed information was obtained only for the area encompassed in these limits.

1.3.1 Logical Termini

For the purposes of this study, the logical termini include I-490 at I-77 and E. 105th Street and Chester Avenue to the east. See **Figure 1-1, page 3**. These points represent the western and eastern terminus, respectively, of the travel corridor for employees, patients, students, residents and tourists. The proposed roadway improvements within the project limits will have independent utility and do not require the implementation of other transportation improvements within the project study area to result in a useful project for the traveling public. Once travelers

reach I-490, they can gain access to the Interstate Highway system; I-77, I-71, and I-90 and connect to the outlying suburbs or the Cleveland Hopkins International Airport. When travelers reach E. 105th Street, they can continue to the University Circle area, Cleveland Heights, Shaker Heights, or other eastern Cleveland-area suburbs via Cedar, Carnegie (SR 10), Euclid (US 20), or Chester (US 322). E. 105th Street provides access to and from the Cleveland Clinic, Case Western Reserve University (CWRU), University Hospital, the proposed CWRU West Campus, and the Veterans Administration (VA) Hospital. Given the logical termini described above, transportation improvements can be developed within the study area to allow for, but do not require, future projects along the corridor and in the region.

Within the logical termini, the study area was divided into three geographic sections (West, Central, and East) to allow for flexibility in the development and evaluation of alternatives. These geographic sections are described in detail in **Section 2.3** of this document. Taken individually, the conceptual alternates described within each one of the geographic sections are a component of an overall Opportunity Corridor project with logical termini. Therefore, for the Opportunity Corridor to advance to Step 6 in the Project Development Process, a complete build alternative must include a build alternate in each of the three geographic sections. The No Build Alternative is viable and will be carried for further study both as a stand-alone alternative and the basis of comparison for the build alternatives. However, it cannot be combined with build alternates in adjacent geographic sections to form a practicable corridor.



CUY - Opportunity Corridor
(PID 77333)
Cleveland, OH

Date: 07/19/2010

Prepared by: LLS

Note:
GIS data used to create this map are from the best sources available. Use of this map should be used only for planning purposes.
Aerial image is dated (circa 2005) and is shown only for illustrative purposes.

0 0.125 0.25 0.5 Miles

NORTH

Figure 1-1
Opportunity Corridor Study Area

2.0 Development of Conceptual Alternatives

ODOT evaluated multiple facility types for accessing University Circle as part of the Innerbelt Study. These included both an extension of the freeway system as well as an at-grade roadway. The freeway concept would have required termination at another freeway, I-90 to the north, and was dismissed due to community impacts and lack of community support. Therefore, a boulevard concept was recommended for further study as a separate project.

This boulevard concept was utilized during Steps 1-4 of the Opportunity Corridor Study and further refined in Step 5. The proposed boulevard facility would be a multi-lane urban arterial with curbs, an elevated landscaped median, multi-modal facilities, landscaping and lighting. A typical section of the proposed facility is included as **Figure 2-1, page 5**. A boulevard would provide improved mobility and access to each neighborhood along the route via at-grade intersections.

Several conceptual alternatives were developed to address the project purpose and need. Alternative development focused on improving local street connectivity; maximizing economic development potential; minimizing disturbances to existing or planned facilities; and minimizing neighborhood impacts. The alternatives evaluated through Step 5 of ODOT's Project Development Process (PDP) are described in the following sections.

2.1 Alternatives Design Criteria

2.1.1 Functional Classifications

The existing roadways were inventoried by functional classification and speed limit. Federal Aid Primary (Truck) routes were also identified. This data, along with the proposed Opportunity Corridor boulevard data is included in **Table 2-1**. Proposed design speeds and roadway classifications are also included in **Table 2-1**. It is proposed that the new facility be classified as an urban arterial with a design speed of 40 miles per hour (mph) and posted speed limit of 35 mph from the western project limit to Quincy Avenue. North of Quincy Avenue, where the median is eliminated and the roadway generally follows the existing E. 105th Street alignment, it is proposed that the design speed be reduced to 30 mph with a posted speed limit of 25 mph. This would provide consistency with the existing E. 105th Street corridor. Existing intersecting streets would be designed at or above the existing posted speed limits, with posted speed limits being utilized to minimize impacts associated with pavement widening.

Table 2-1: Roadway Functional Classification and Speed Limit

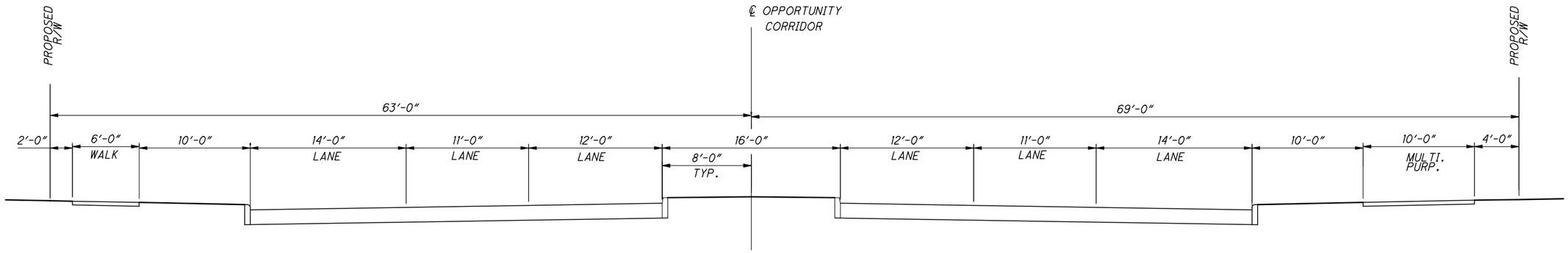
Roadway	Federal Aid Primary Route	Existing Functional Classification	Existing Speed Limit	Proposed Design Speed	Criteria Applied
Proposed Boulevard	N/A	N/A	N/A	40 mph	Arterial
E. 55th Street	No	Minor Arterial	35 mph	35 mph	Arterial
Kinsman Road	Yes	Minor Arterial	35 mph	35 mph	Arterial
E. 75th Street	No	Local	25 mph	30 mph	Local
E. 79th Street	No	Minor Arterial	25 mph	30 mph	Arterial
Buckeye Road	No	Principal Arterial	35 mph	35 mph	Arterial
Woodland Avenue	No	Collector	35 mph	35 mph	Collector
E. 89th Street	No	Local	25 mph	30 mph	Local
E. 93rd Street	No	Local	25 mph	30 mph	Local
Quincy (West of E. 105th Street)	No	Collector	35 mph	35 mph	Collector
Quincy (East of E. 105th Street)	No	Minor Arterial	35 mph	35 mph	Collector
E. 105th Street	No	Minor Arterial	25 mph	30 mph	Arterial
Cedar Avenue	No	Local	35 mph	35 mph	Collector
Carnegie Avenue	No	Principal Arterial	35 mph	35 mph	Arterial
Euclid Avenue	No	Minor Arterial	25 mph	30 mph	Arterial
Chester Avenue	Yes	Principal Arterial	35 mph	35 mph	Arterial

2.1.2 Design Criteria

Based on functional classifications and proposed design speeds identified in **Section 2.1.1**, geometric design criteria was developed for the various roadways based on requirements of *ODOT's Location and Design Manual (October 2009)*. Due to the urban nature of the project and the desire to minimize impacts, minimum design standards were applied. The geometric design criteria are presented in **Table 2-2** and **Table 2-3**.

Table 2-2: Geometric Design Criteria based on Functional Classification

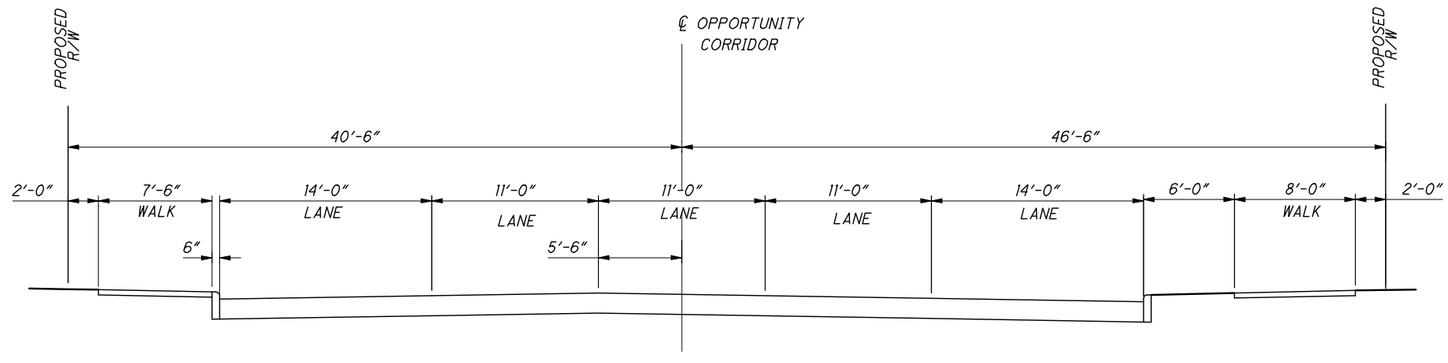
Classification	Arterial (Urban, ADT>4000)	Collector (Urban, ADT>4000)	Local (Urban, ADT>4000)
Applicable Roadways	Proposed Boulevard E. 55th Street Kinsman Road E. 79th Street Buckeye E. 105th Street Carnegie Avenue Euclid Avenue Chester Avenue	Woodland Avenue Quincy Cedar	E. 75th Street E. 89th Street E. 93rd Street
GENERAL			
Lane Width F301-4	11' (Min 1-12' lane for FAP routes) #	11'	11' (Commercial) 10' (Residential)
Lateral Clearance under Bridge (Roadway Width) F302-1	Road width plus barrier clearance	Road width plus barrier clearance	Road width plus barrier clearance
Shoulder Width F301-4	1' (Curbed Pavements)	1' (Curbed Pavements)	1' (Curbed Pavements)
Offset to ROW F306-2	10' Min. and Varies (see Typ. Sec.)	10' Min. and Varies (see Typ. Sec.)	10' Min. and Varies (see Typ. Sec.)
VERTICAL ALIGNMENT			
Min. Grade (Curbed pavement) ODOT L&D 1, Section 203.2.2	0.5% Preferred 0.3% Minimum	0.5% Preferred 0.3% Minimum	0.5% Preferred 0.3% Minimum
Max. Grade F203-1	7% (35-40 mph level)	7% (35-40 mph level)	9% (30 mph level)
Allowable Driveway Grade Break (Residential) F803-2	12% Sag (10' min. length) 8% Crest (5' min. length)	12% Sag (10' min. length) 8% Crest (5' min. length)	12% Sag (10' min. length) 8% Crest (5' min. length)
Allowable Driveway Grade Break (Commercial) F804-1	5% Sag (20' min. length) 5% Crest (20' min. length)	5% Sag (20' min. length) 5% Crest (20' min. length)	5% Sag (20' min. length) 5% Crest (20' min. length)
Vertical Clearance over Road F302-1	15.5'	14.5'	14.5'



WEST AND CENTRAL GEOGRAPHIC SECTIONS

E. 55TH ST. TO QUINCY AVE.

NOTE: NUMBER OF TRAVEL LANES REDUCE FROM 6 TO 4 LANES WITHIN CENTRAL SECTION.



EAST GEOGRAPHIC SECTION

QUINCY AVE. TO CHESTER AVE.

TYPICAL SECTIONS

FIGURE 2-1

5

CALCULATED | CHECKED

\\clew00\pmwork\JOBS\39853\TECHPROD\hwy\design\39853GY001.dgn 22-JUL-2010 2:54PM bmacmillan

Table 2-3: Geometric Design Criteria based on Design Speed

Design Speed	40 MPH	35 MPH	30 MPH
Applicable Classifications	**Arterial**	**Arterial**	**Collector**
Applicable Roadways	Proposed Boulevard	E. 55th Street Kinsman Buckeye Woodland Quincy Cedar Carnegie Chester	E75th E 79th E 89th Euclid E 93rd Other non-listed local roadways
Horizontal Alignment			
Max CL Deflection w/o Horizontal Curve F202-1	2° 15'	2° 45'	3° 45'
Operational Offset (curbed pavements)	1.5' Face of curb to obstruction	1.5' Face of curb to obstruction	1.5' Face of curb to obstruction
ODOT L&D 1, Section 600.2.2	3' at intersections	3' at intersections	3' at intersections
Superelevation F202-9	0.040 Max.	0.040 Max.	0.040 Max.
Max. Dc w/super F202-2	10° 45'	15° 30'	22° 45'
Max. Dc w/o Super F202-3	7° 42'	11° 28'	17° 30'
Vertical Alignment			
Max. Change w/o vertical curve F203-2	0.75%	0.95%	1.30%
K (Crest) F203-3	44	29	19
K (SAG) F203-6	64	49	37
Intersection Sight Distance F201-5	445' for left turn; 385' for right turn	390' for left turn; 335' for right turn	335' for left turn; 290' for right turn
Stopping Sight Distance F201-1	305'	250'	200'

Note: The abbreviation "F202-1" = ODOT Location and Design Manual, Volume 1, Figure 202-1E.

2.1.3 Design Exceptions

The conceptual alternatives were developed in accordance with the functional classifications and design criteria identified in **Sections 2.1.1** and **2.1.2**. At this time, no design exceptions have been identified for any of the build alternatives.

2.2 Step 4 Conceptual Alternatives

During Steps 1 through 4 of ODOT's PDP, four conceptual alternatives were developed:

- Conceptual Alternative 1: Widen E. 55th Street and Woodland Avenue with a new connection to E. 105th Street at Quincy Avenue
- Conceptual Alternative 2: Construct a boulevard on new alignment that crosses over the NS and GCRTA rail trench west of E. 55th Street then crosses back over the trench east of Kinsman Road
- Conceptual Alternative 3: Construct a boulevard on new alignment completely north of the Norfolk Southern (NS) and GCRTA Red line railroad trench
- Conceptual Alternative 4: Construct a boulevard on new alignment completely south of the railroad trench
- No Build Alternative

Figure 2-2 on **page 7** shows the four Step 4 conceptual alternatives. To address concerns over poor traffic operations at the I-490/E. 55th Street intersection, the conceptual alternatives were expanded to include four grade separation options at I-490 and E. 55th Street. These grade separation options are listed below and are shown in **Figure 2-3** in **Appendix A**.

- A conventional diamond interchange
- A braided diamond interchange
- A parkway interchange
- A braided T interchange

Detailed descriptions of the conceptual alternatives, including the I-490/E. 55th Street grade separation options, are included in the project's *Strategic Plan* (September, 2006).

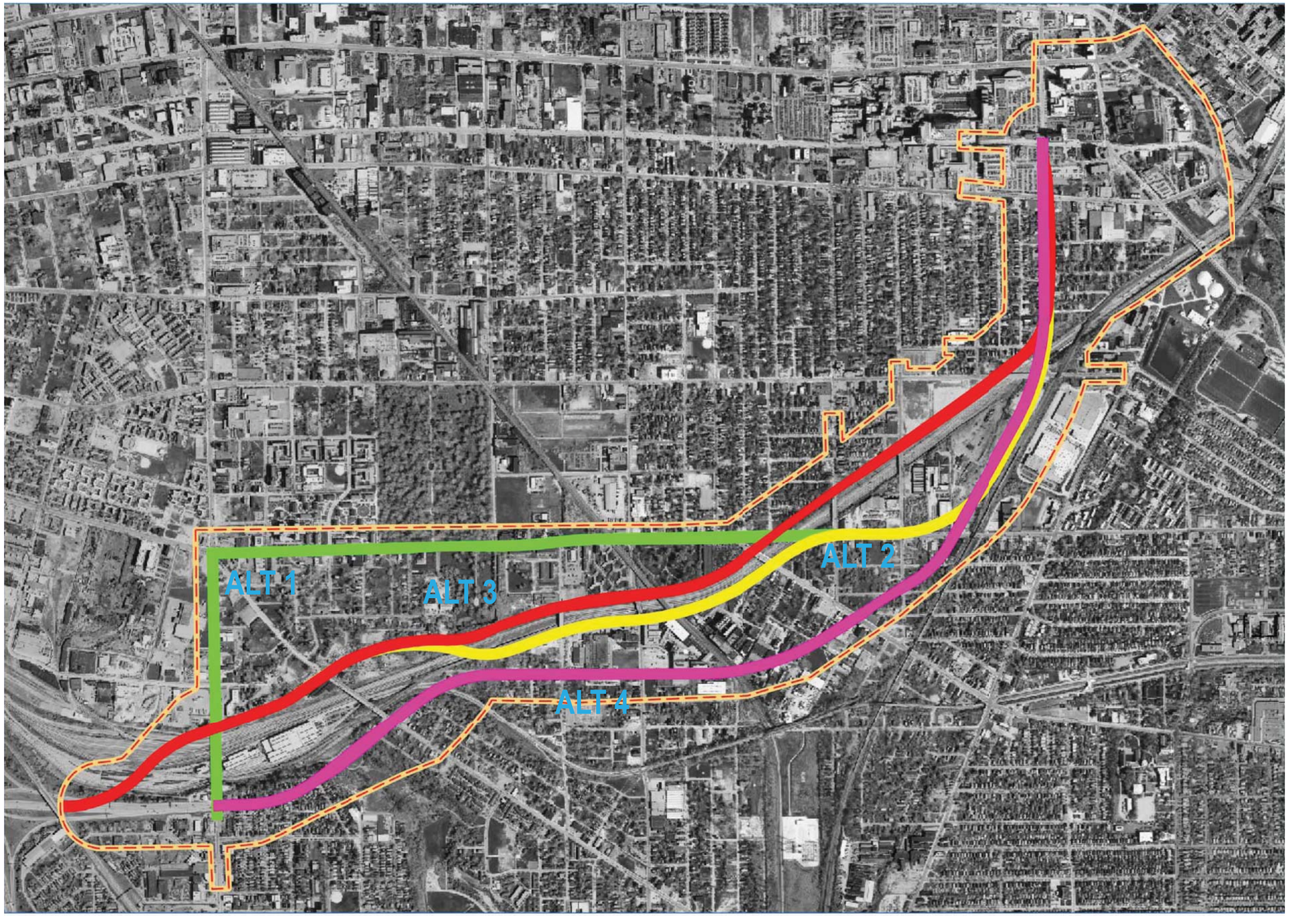
ODOT worked with project stakeholders to develop evaluation criteria against which the conceptual alternatives could be measured. An evaluation matrix was then developed to compare the conceptual alternatives in six primary categories. These categories included:

- Purpose and Need Issues
- Environmental Resources
- Utility Relocation Issues
- Right-of-Way
- Structures
- Planning Level Cost Estimates

After considering the findings and conclusions of the conceptual alternatives evaluation, as well as the recommendations of the Steering Committee, ODOT and FHWA decided to advance Conceptual Alternative 2 (eastern portion only) and Conceptual Alternative 4 for further study in Step 5 of ODOT's PDP. ODOT and FHWA also decided to advance the southern braided T interchange at E. 55th Street and I-490 to the next phase of the study.

A brief summary of the conceptual alternatives evaluation completed during Step 4 is contained below:

- Conceptual Alternative 1 was dismissed due to its inability to meet elements of the purpose and need of the project as it would not support the development and redevelopment of large vacant tracts of industrial and residential land contained in the development districts identified by the City of Cleveland located south of the GCRTA trench. It also had high impacts associated with Woodland Avenue widening, including impacts to community facilities, cemeteries and churches.



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NOT TO SCALE

NORTH

Figure 2-2

Step 4 Conceptual Alternatives

- The western portion of Conceptual Alternative 2 was dismissed due to rail impacts and geometric challenges associated with crossing the GCRTA and NS rail yards west of E. 55th Street; the inability to utilize grade separation alternatives north of the rail trench due to the proximity to the rail yard; substantial impacts to Orlando Bakery's (a large local employer) existing facilities, and the inability to provide an at-grade intersection at E. 79th Street due to the proximity to the NS Mainline overpass structure over NS Nickelplate and GCRTA Redline. The eastern portion of the alternative was recommended for further study due to its economic development potential and moderate level of impact.
- Conceptual Alternative 3 was dismissed due to its inability to meet elements of the purpose and need of the project as it would not support the development and redevelopment of large vacant tracts of industrial and residential land contained in the development districts identified by the City of Cleveland located south of the GCRTA railroad trench. Community impacts such as cemetery impacts and substantial impacts to the planned Cuyahoga County Juvenile Justice Center at E. 93rd Street and Woodland Avenue were additional reasons for elimination of Conceptual Alternative 3.
- Conceptual Alternative 4 was recommended for further study due to the extent of new frontage created on both sides of the roadway and its proximity to large tracks of vacant land south of the GCRTA trench.
- The Conventional Diamond Interchange alternative was dismissed since traffic movements between I-77 and the boulevard would need to utilize the E. 55th Street ramps. This would result in driver confusion and possible safety issues. Because of the control of access required in the area of the proposed interchange, this alternative would not accommodate access to the proposed GCRTA transit station being planned for the east side of the east side of the E. 55th Street roadway. Local community members also did not desire freeway ramp elements located east of E. 55th Street due to concerns over local access and contextual conflict between residential land uses and a freeway facility.
- The Braided Diamond Interchange alternative was dismissed. Although, the braiding of the I-77 ramps west of E. 55th Street addressed some concerns associated with merging and weaving movements and lack of driver response times created by the conventional diamond interchange configuration, it created additional commercial and GCRTA impacts west of E. 55th Street. Additionally, because of the required access control associated with the proposed interchange, this alternative would not provide access to the GCRTA transit station. Additionally, it did not resolve local access and context concerns created by having freeway elements east of E. 55th street.
- The Parkway Interchange alternative was dismissed. This alternative provided full access between the boulevard, the freeway system and E. 55th Street through a pair of two-way, low speed access ramps located east of E. 55th Street. The northerly ramps also facilitated indirect access to the proposed GCRTA transit station. However, there were safety concerns regarding the low speed ramp geometry in proximity to the high speed interstate terminus at E. 55th Street. Of special concern was truck safety due to a high volume of trucks using E. 55th Street to access the freeway system. Higher residential impacts were also a concern regarding this alternative.
- The Braided T Interchange alternative was developed to address access concerns regarding the previously identified grade separation alternatives. The alignment of the roadway was shifted north to minimize residential impacts east of E. 55th Street. All existing movements between E. 55th Street and I-77/I-490 were also provided through the series of ramps located west of E. 55th Street. Access to the GCRTA train station could also be accommodated through a widened bridge structure over the boulevard or through a southerly relocation of the headhouse and lengthening of the elevated walkway to the platform. It was recognized that access between E. 55th Street and the boulevard could not be provided due to access implications to the transit station and without impacting additional residential properties. Based on the results of the alternatives analysis, ODOT and FHWA decided to further study this alternative during Step 5.

The Step 4 conceptual alternatives and the recommendations were presented to the public through a series of formal public meetings and neighborhood meetings. In general, the public agreed with the conceptual alternatives recommended for further study in Step 5. The comments indicated that the opportunity for economic development with the more southern alignments (Alternatives 2 and 4) was desirable. This is consistent with ODOT's screening process and affirms the recommendation of conceptual alternatives to be studied further in Step 5 of the PDP. Other comments suggested both concern and support for a grade-separated intersection at E. 55th Street and I-490. The public wanted to maintain local access while still improving traffic operations. After hearing this, ODOT developed and evaluated the quadrant roadway option which will be presented in **Section 2.3.1**. Summaries of public meeting comments are included in **Chapter 4** and specific comments are listed in **Appendix D** of this report.

2.3 Step 5 Conceptual Alternatives

The two conceptual alternatives that were advanced to Step 5 of ODOT's PDP were further developed and refined based on environmental studies, traffic analysis, refinement of horizontal alignments, cost estimates, utilities coordination, and stakeholder coordination. Additional engineering studies during Step 5 focused on understanding existing and projected traffic operations of the study area transportation network. The study team also reviewed the geometric design details of the conceptual alternatives to better understand how the project would fit in with the community. Work during Step 5 also identified additional roadway alignments and intersection configurations to avoid and minimize impacts to the surrounding community. These additional alternates included:

- One new alternate to address traffic operations and access concerns at the intersection of I-490, E. 55th Street, and the proposed Opportunity Corridor Boulevard.
- One additional roadway alignment alternate between E. 75th Street and Quincy Avenue.
- Three separate alignment alternates for widening E. 105th Street between Quincy Avenue and Chester Avenue.

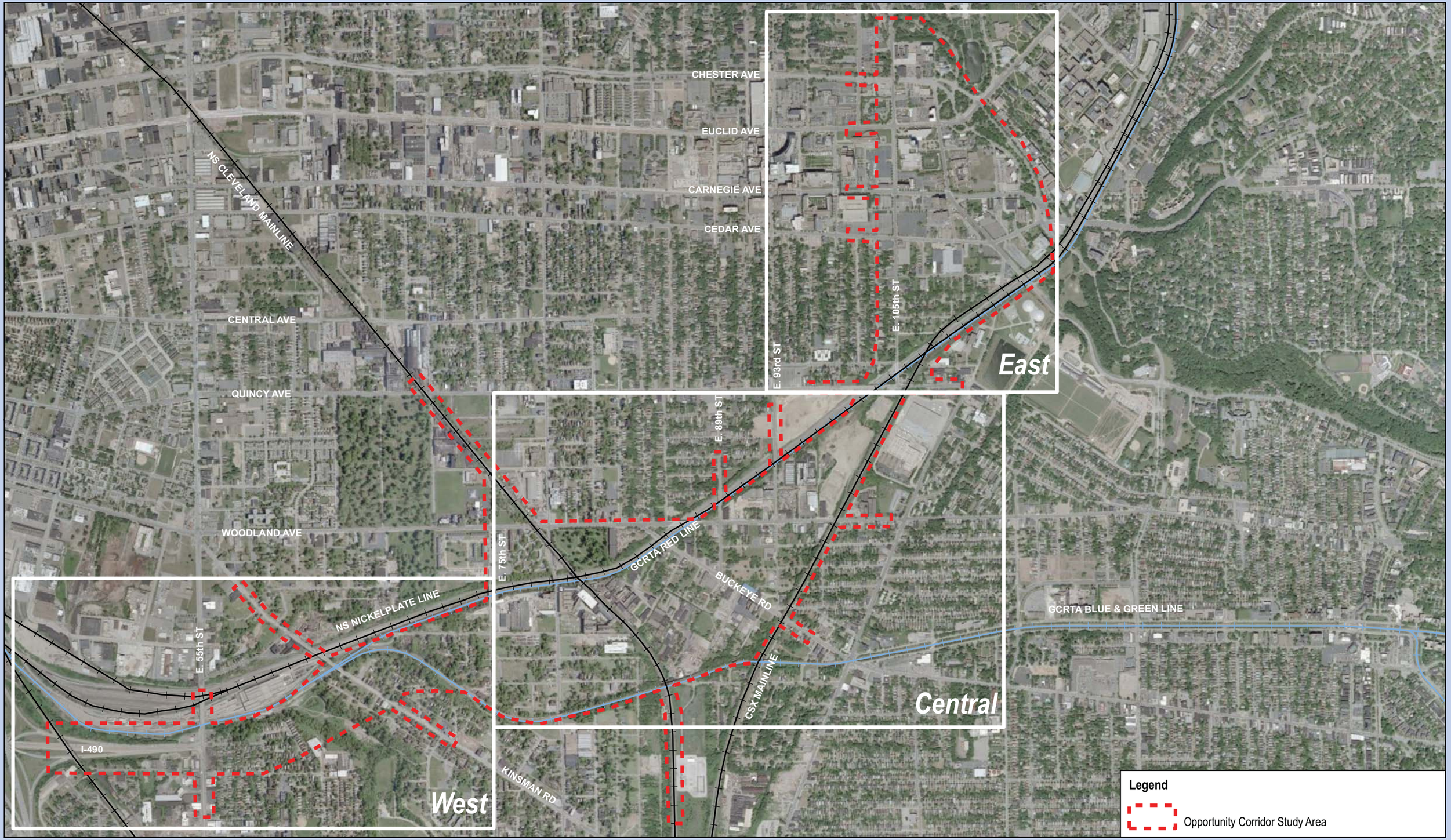
Also during Step 5, as mentioned previously, the study area was divided into three geographic sections (i.e., West, Central, and East), as shown in **Figure 2-4, page 9**. Using the two conceptual alternatives that were advanced from Step 4 as the starting point, three different alternates (A/B/C) were developed and/or refined within each geographic section. The boundaries of the sections were established such that each alternate within a given section is compatible with those in the adjacent geographic sections. Therefore, any alternate from one geographic section can be combined with any alternate from the other geographic sections. This results in a total of twenty-seven possible options to create a build alternative for the Opportunity Corridor project. The alternates within each geographic section are described below and illustrated in **Figure 2-5, Appendix A. Figure 2-6, Appendix A** contains preliminary bridge configurations for each of the alternates.

2.3.1 West Geographic Section

The West Section is located in the Saint Hyacinth neighborhood of Slavic Village and the Kinsman neighborhood between I-77 and E. 75th Street and includes the intersection of E. 55th Street and I-490. The boulevard section would be utilized. Design year traffic capacity analysis requires three through lanes in each direction along the boulevard and turn lanes at intersecting streets, as described below. Modifications to the GCRTA's E. 55th Street transit station would be required and are described in **Section 3.10.2**.

West Alternate A

West Alternate A would consist of a conventional, four-legged, signalized intersection at I-490/E. 55th Street/proposed boulevard. Access from I-77 to northbound E. 55th Street would be redirected to Kinsman Road due to inadequate weaving distance between the I-77 ramp terminus and proposed intersection at E. 55th Street. E. 55th Street would be widened by one lane to accommodate a southbound left turn lane. A new bridge would be constructed over the Kingsbury Run Valley at the existing GCRTA train loop, and a new four-legged signalized intersection would be created at Kinsman Road at E. 66th Street. Kinsman Road would be widened by one lane to incorporate left-turn lanes onto the proposed boulevard. Pavement width would also be increased to meet federal truck route standards. East of Kinsman Road, a new bridge would be constructed over the GCRTA Blue/Green lines, with an alignment that would adjoin existing Grand Avenue west of E. 75th Street. Access to GCRTA's Central Train Maintenance facility in the rail trench would be provided via the proposed boulevard. This alternate would require E. 57th Street, E. 59th Street, E. 61st Street, E. 64th Street, Berwick Road, Colfax Road, and E. 73rd Street to be either connected to the proposed boulevard or disconnected through construction of a cul-de-sac near the proposed boulevard. Since these are local streets, this decision would be made in coordination with the City of Cleveland. Bower Avenue, Butler Avenue, E. 66th Street and E. 68th Street would be removed.



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Cleveland, OH

Date: 07/19/2010

Prepared by: LLS

Note:
GIS data used to create this map are from the best sources available. Use of this map should be used only for planning purposes.
Aerial image is dated (circa 2005) and is shown only for illustrative purposes.

0 0.125 0.25 0.5 Miles

NORTH

Figure 2-4

Step 5 Geographic Sections

West Alternate B

West Alternate B would depress I-490 under E. 55th Street just north of the existing intersection with a system of ramps west of E. 55th Street. Existing access between the freeways and E. 55th Street would be maintained; however, access would not be provided between E. 55th Street and the proposed boulevard. GCRTA's electric substation would be relocated west of the existing site, and a new access to the station would be provided from E. 34th Street/Iron Court to the west. A new bridge would be constructed over the Kingsbury Run Valley at the existing GCRTA train loop, and a new four-legged, signalized intersection would be created at Kinsman Road at E.66th Street. Kinsman Road would be widened by one lane to incorporate left-turn lanes onto the proposed boulevard. Pavement width would also be increased to meet federal truck route standards. East of Kinsman Road, a new bridge would be constructed over the GCRTA Blue/Green lines with the alignment that would adjoin existing Grand Avenue west of E. 75th Street. Access to GCRTA's Central Train Maintenance facility in the rail trench would be provided via the proposed boulevard. This alternate would require E. 64th Street, Berwick Road, Colfax Road, and E. 73rd to be either connected to the proposed boulevard or disconnected through construction of a cul-de-sac near the boulevard. Since these are local streets, this decision would be made in coordination with the City of Cleveland. E. 66th Street and E. 68th Street would be removed.

West Alternate C

West Alternate C would depress I-490 under E. 55th Street at the existing I-490/E. 55th Street intersection. A quadrant roadway would be constructed in the vicinity of E. 59th Street to provide full access between E. 55th Street, the freeways, and the proposed boulevard. A new bridge would be constructed over the Kingsbury Run Valley at the existing GCRTA train loop, and a new four-legged, signalized intersection created at Kinsman Road and E. 66th Street. Kinsman Road would be widened by one lane to incorporate left-turn lanes onto the proposed boulevard. Pavement width would also be increased to meet federal truck route standards. East of Kinsman Road, a new bridge would be constructed over the GCRTA Blue/Green lines with the alignment that would adjoin existing Grand Avenue west of E. 75th Street. Access to GCRTA's Central Train Maintenance facility in the rail trench would be provided via the proposed boulevard. This alternate would require Berwick Road, Colfax Road, and E. 73rd to be either connected to the boulevard or disconnected through construction of a cul-de-sac near the proposed boulevard. Since these are local streets, this decision would be made in coordination with the City of Cleveland. E. 57th Street, E. 66th Street, and E. 68th Street would be removed and Francis Avenue and Bower Avenue would be partially removed.

2.3.2 Central Geographic Section

The Central Section is located between E. 75th Street and Quincy Avenue in the Kinsman, Buckeye and Fairfax neighborhoods. The boulevard section would be utilized. Design year traffic capacity analysis requires three through lanes in each direction along the boulevard from E. 75th Street through Buckeye Road. Alternate A would retain this lane use through Woodland Avenue, while Alternates B and C would reduce to two through lanes in each direction on the west approach to Woodland Avenue. For all alternates, turn lanes would be provided at intersecting streets, as described below.

Central Alternate A

Central Alternate A would adjoin the West Section alternates with a four-legged signalized intersection at E. 75th Street. The alignment would utilize existing Grand Avenue through a four-legged, signalized intersection at E. 79th Street. E. 79th Street would be widened by one lane to provide left-turn lanes onto the boulevard. East of E. 79th Street, a new underpass structure would be constructed to take the roadway under the Norfolk Southern mainline tracks. The alignment would continue in a northeasterly direction to a new four-legged, signalized intersection at Buckeye Road and would then curve onto Woodland Avenue at E. 89th Street. Buckeye Road would be widened by two lanes to provide dual westbound left-turn lanes and a single eastbound left-turn lane onto the proposed boulevard. Woodland Avenue would be realigned to connect with existing Buckeye Road at its proposed intersection with the boulevard and the existing Woodland Avenue bridge over NS and GCRTA would be removed. E. 86th Street would be realigned from Woodland to Buckeye Road. The existing Woodland Avenue alignment would be maintained between the signalized intersections at E. 89th Street and E. 93rd Street. E. 93rd Street and Woodland Avenue would be realigned to form a new four legged, signalized intersection with the proposed boulevard. East of E. 93rd Street, the alignment would curve northeasterly and adjoin with E. 105th Street at a new four-legged, signalized intersection at Quincy Avenue. The alignment of Central Alternate A would create a discontinuity of existing Woodland Avenue between Buckeye Road and E. 93rd Street. This alternate would require a cul-de-sac on E. 84th Street north of Woodland Avenue. E. 87th Street and Evans Avenue would either be connected to the proposed boulevard or disconnected through construction of a cul-de-sac near the proposed boulevard. Since these are local streets, this decision would be made in coordination with the City of Cleveland. Lisbon Road would be removed.

Central Alternate B

Central Alternate B would adjoin the West Section alternates with a four-legged intersection at E. 75th Street. The alignment would utilize existing Grand Avenue through a four-legged, signalized intersection at E. 79th Street. E. 79th Street would be widened by one lane to provide left-turn lanes onto the boulevard. East of E. 79th Street, a new underpass structure would be constructed to take the roadway under the Norfolk Southern mainline tracks. East of the railroad, the roadway would align with Tennyson Avenue and continue to a new four-legged, signalized intersection at Buckeye Road. Buckeye Road would be widened by two lanes to provide dual westbound left-turn lanes and a single eastbound left-turn lane onto the boulevard. Continuing on a northeasterly alignment, a new four-legged, signalized intersection would be created at Woodland Avenue near E. 89th Street. Woodland Avenue would be widened by one lane to provide left-turn lanes onto the proposed boulevard. North of Woodland Avenue, the alignment would generally run parallel to the GCRTA Red Line trench and adjoin with E. 105th Street at a new four-legged, signalized intersection at Quincy Avenue. This alternate would require a cul-de-sac on E. 89th Street north of the GCRTA trench and south of the proposed boulevard. Tennyson Avenue and E. 87th Street would be removed. Evarts Road would either be removed or connected to the proposed boulevard.

Central Alternate C

Central Alternate C would adjoin the West Section alternates with a four-legged signalized intersection at E. 75th Street. The alignment would utilize existing Grand Avenue through a four-legged, signalized intersection at E. 79th Street. E. 79th Street would be widened by one lane to provide left-turn lanes onto the boulevard. East of E. 79th Street, a new underpass structure would be constructed to take the roadway under the Norfolk Southern mainline tracks. East of the railroad, the roadway would continue to a new four-legged, signalized intersection at Buckeye Road near E. 90th Street. Buckeye Road would be widened by two lanes to provide dual westbound left-turn lanes and a single eastbound left-turn lane onto the proposed boulevard. Continuing on a northeasterly alignment, a new four-legged, signalized intersection would be created at realigned E. 93rd Street and realigned Cumberland Avenue. The boulevard would continue to a new four-legged, signalized intersection at Woodland Avenue near the existing CSX Railroad overpass. Woodland Avenue would be widened by one lane to provide a left-turn lane onto the boulevard. North of Woodland Avenue, the alignment would run parallel to the elevated CSX Railroad alignment and adjoin with E. 105th Street at a new four-legged, signalized intersection at Quincy Avenue. This alternate would require that a cul-de-sac be constructed on E. 93rd Street south of the proposed boulevard. Kennedy Avenue would be closed at CSX and removed to the west. Yeakel and Steinway Avenues could require closure to facilitate CSX bridge construction at Buckeye Road. In addition, E. 90th Street would require that the access be revised from Buckeye Road to the proposed boulevard due to the location of the Buckeye/Boulevard intersection. This alternate would require the removal of E. 89th Street south of Buckeye Road. Evarts Road would be connected to the proposed boulevard or disconnected through construction of a cul-de-sac near the proposed boulevard.

2.3.3 East Geographic Section

The East Section is located along E. 105th Street from Quincy Avenue to Chester Avenue. All of the East alternates would widen E. 105th Street to a 5-lane, undivided typical section with two through lanes in each direction.

East Alternate A

East Alternate A would adjoin the Central Section at Quincy Avenue and continue north along E. 105th Street. The existing E. 105th Street bridge over GCRTA and NS would be widened. The roadway would be widened on the west side from Quincy Avenue to just north of Cedar Avenue. North of Cedar Avenue, the roadway widening would vary along both the east and west side of E. 105th Street through the Chester Avenue intersection to avoid impacts to existing commercial and institutional buildings. Carnegie Avenue would be widened by one lane to provide a westbound dual left-turn onto the proposed boulevard.

East Alternate B

East Alternate B would adjoin the Central Section at Quincy Avenue and continue north along E. 105th Street. The existing E. 105th Street bridge over GCRTA and NS would be widened. The roadway would be widened symmetrically on the existing centerline from Quincy Avenue to just north of Cedar Avenue. North of Cedar Avenue, the roadway widening would vary along both the east and west side of E. 105th Street through the Chester Avenue intersection to avoid impacts to existing commercial and institutional buildings. Carnegie Avenue would be widened by one lane to provide a westbound dual left-turn onto the proposed boulevard.

East Alternate C

East Alternate C would adjoin the Central Section at Quincy Avenue and continue north along E. 105th Street. The existing E. 105th Street bridge over GCRTA and NS would be widened. The roadway would be widened on the east side from Quincy Avenue to just north of Cedar Avenue. North of Cedar Avenue, the roadway widening would vary along both the east and west side of E. 105th Street through the Chester Avenue intersection to avoid impacts to existing commercial institutional buildings. Carnegie Avenue would be widened by one lane to provide a westbound dual left-turn onto the proposed boulevard.

3.0 Evaluation of Alternatives

Studies completed for Step 5 included environmental field studies, design year traffic analyses, refinement of horizontal alignments, cost estimates, utilities coordination, and stakeholder coordination. The following sections present the results of these studies. A summary matrix of the impacts, design features, and costs of the conceptual alternatives is provided in **Appendix B.**

3.1 Traffic and Capacity Analyses

3.1.1 Existing & Future Traffic Development

During Steps 1 through 4 of the Project Development Process (PDP), Northeast Ohio Areawide Coordinating Agency (NOACA) estimated existing (2000) and future (2030) ADT traffic volumes for the No Build alternative and the four preliminary alternatives using traffic count data performed in 2005 and their Tranplan regional traffic model. Since the time of the original traffic development, roadway improvement projects coordinated through the City of Cleveland modified the lane configurations in the University Circle area along Carnegie Avenue, Cedar Road, and Euclid Avenue. Additional traffic counts were conducted within the University Circle area in 2009 to ensure that output from the traffic model was still appropriate based on the revised existing lane usage. After reviewing the updated traffic count information, NOACA confirmed the ADT traffic volumes previously developed were still valid for analysis of the refined alternatives during Step 5.

Demand for the east and west destinations are fairly evenly split during both the AM and PM peak hours. In the AM peak, there are many travelers that come from I-77/I-71/I-90 with University Circle as their destination (eastbound). At the same time, there are many motorists leaving the Heights area and wanting access to I-77/I-71/I-90 (westbound). Across the study area, traffic counts indicate that peak period traffic is approximately ten percent of the average daily traffic. This peak hour factor (PHF) was applied to the ADT volumes provided by NOACA to develop estimates of peak hour future traffic volumes used in the traffic analysis. Traffic volumes are highest where traffic accesses the freeway system at the west end of the project at the E. 55th Street intersection. At this location an eight percent PHF was applied to the West Alternate A. Further discussion of traffic projections is contained in **Section 3.1.2**.

NOACA recently updated their regional model and is validating their model. They are also examining the affects to traffic volumes associated with changing the underlying land use proposed by the City of Cleveland. Refined traffic plate information will be supplied by NOACA for both the No Build and build alternatives should the study advance to Step 6.

3.1.2 Capacity Analyses

According to the *Highway Capacity Manual*[1], "Level of Service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience". Levels of service range from A to F. LOS A describes near-ideal traffic operation characterized by excellent progression of the traffic stream. Level of service F, on the other hand, represents a breakdown on the transportation network characterized by heavy congestion and long delays. LOS C is often considered the minimum acceptable level of service in rural, unincorporated areas. In urban areas, such as the Opportunity Corridor project study area, LOS D is acceptable.

For signalized intersections, control delay is used to estimate LOS. Control delay includes the time consumed by initial deceleration, queue move-up, stopped traffic, and final acceleration that would not occur in the absence of traffic control.

Level of service analyses were conducted using Highway Capacity Software (HCS+) for projected design year (2030) traffic volumes for the No Build alternative, as well as the build alternatives. The purpose of these analyses was to determine the number of thru lanes and turn lanes at each intersection that are required to achieve an acceptable LOS of D or better.

The Step 5 conceptual alternatives were also analyzed using Synchro modeling software.

Table 3-1 lists the future LOS and delay in at the major intersections for the No Build alternative. With the exception of the intersection of I-490 and E. 55th Street, the major intersections in the study area are projected to operate at acceptable (i.e.., LOS D or better) levels of service.

[1] Highway Capacity Manual, 2000

Table 3-1: Future (2030) Intersection LOS for No Build Alternative

Intersection	Peak Hour LOS (delay in seconds)
I-490/E. 55th Street	F (98.1)
Woodland/Kinsman/E. 55th Street	D (47.7)
Woodland/E. 79th Street	B (19.8)
Woodland/Buckeye	C (30.9)
Boulevard (E. 105th) & Cedar	B (17.9)
Boulevard (E. 105th) & Carnegie	D (37.6)
Boulevard (E. 105th) & Euclid	N/A due to Bus Rapid Transit operations along Euclid Avenue
Boulevard (E. 105th) & Chester	D (41.6)

As previously stated, lane use configurations for the build alternatives were developed to achieve LOS D. **Table 3-2** below illustrates the actual LOS obtained for each signalized intersection. Lane use for each intersection is included in **Figure 3-1, Appendix A**. With the exception of one intersection, I-490 and E. 55th Street (West Alternate A), all intersections can be designed to achieve LOS D or better. The intersection of I-490 and E. 55th Street has high traffic demands from traffic entering and exiting the freeway system. Initial analysis was performed at this location using a 10% PHF. Results of this analysis indicated that, even with a very large intersection (i.e., 9- lanes on boulevard and 6-lanes on E. 55th Street), an acceptable level of service could not be obtained. Due to the nature of the study area and the characteristics of the proposed facility, it is anticipated that the proposed project would be used by a number of commuters wishing to access the cultural, medical and educational institutions in the University Circle Area. These types of facilities often experience highest traffic demands at times separate from traditional AM/PM peak periods for other roadway facilities. Consequently, it was decided that using a slightly reduced peak hour factor would provide a more realistic analysis of anticipated design year traffic operations. Consequently, a 2% downward adjustment to the PHF was applied to this location to determine if this would provide acceptable operations. Using an 8% PHF and the 9-lane boulevard section, the at-grade intersection would still operate at LOS E. The 9-lane facility represents the largest intersection deemed feasible for this location and hence was the basis for evaluating grade-separated alternatives. It is recommended that the at-grade intersection be reevaluated once refined traffic data is provided by NOACA.

Table 3-2: Future (2030) Intersection LOS for Step 5 Conceptual Alternatives

Intersection	Alt A LOS	Alt B LOS	Alt C LOS
West Section			
Proposed Boulevard/E.55th Street	***E***	-	-
Proposed Ramps/E. 55th Street	-	C	-
Proposed Boulevard/ Proposed Quadrant Roadway	-	-	C
E. 55thStreet/Proposed Quadrant Roadway	-	-	C
Proposed Boulevard/Kinsman	C	C	C
Central Section			
Proposed Boulevard/E. 79th Street	B	C	C
Proposed Boulevard/Buckeye Road	C	C	C
Proposed Boulevard/Woodland Avenue	-	B	B
Woodland Avenue/Buckeye Road	-	C	C
Proposed Boulevard/E. 89th Street	B	-	-
Proposed Boulevard/E. 93rd Street (E.93rdStreet/Woodland Avenue for Alt A only)	C	A	A

Table 3-2: Future (2030) Intersection LOS for Step 5 Conceptual Alternatives (continued)

East Section			
Proposed Boulevard/Quincy Avenue	C	B	B
Proposed Boulevard (E. 105th)/Cedar Avenue	B	B	B
Proposed Boulevard (E. 105th)/Carnegie Avenue	C	C	C
Proposed Boulevard (E. 105th)/Euclid Avenue	C	C	C
Proposed Boulevard (E. 105th)/Chester Avenue	C	C	C

3.2 Community Characteristics

As a facility, the proposed Opportunity Corridor project will serve a much larger area than just where the construction activities and operational changes will occur. Therefore, a demographic area was defined to aid in characterizing the study area. The demographic area encompasses the following 19 Census Tract Block Groups and was used as the basis for determining the characteristics of the populations:

- CT 114, BG 4
- CT1132, BG 2
- CT 1135, BG 2
- CT 1136, BG 1
- CT 1136, BG 2
- CT 1139, BG 1
- CT 1141, BG 1
- CT 1142, BG 1
- CT 1143, BG 1
- CT 1144, BG 1
- CT 1145, BG 1
- CT 1146, BG 1
- CT 1146, BG 2
- CT 1147, BG 1
- CT 1148, BG 1
- CT 1187, BG 3
- CT 1189, BG 1
- CT 1191, BG 1
- CT 1192.02, BG 2

In summary, when compared to the City of Cleveland demographic averages as a whole, the demographic area reflects the following characteristics:

- A primarily African American population, 69%
- More households with fewer residents in them
- More one-person households
- More households with persons over 65 years of age
- More persons living below poverty
- Fewer cars with a less mobile population
- Fewer persons that own their own home

Detailed demographic data supporting these conclusions can be found in the following sections.

3.2.1 Population

Methodology to Identify Population

The most comprehensive, readily available source of information for the study area is 2000 Census Data published by the U.S. Bureau of the Census. Unless otherwise noted, data for this report originated from the U.S. Bureau of the Census. The national 2010 Census has been taken, and 2010 data is schedule to be released in March 2011. This assessment will be reevaluated at that time as needed.

Estimated population totals for the Opportunity Corridor study area and demographic area were derived through the following steps:

1. First, Census Block Groups with boundaries that are within the Opportunity Corridor study area were identified.
2. Second, Census Blocks within the above Block Groups were identified.
3. Third, Census Blocks and Census Block Groups containing no residential population were removed from the population calculations. This determination was made by comparing 2000 Census Block data against available aerial photography (circa 2005) to identify areas where no residential units existed.[2]

   Finally, the remaining Census Blocks containing residential population were evaluated to approximate how much was contained within the study area boundary. Percentages were assigned to each Census Block and multiplied by the total Census Block population to derive the study area population estimate.

As summarized in **Table 3-3**, the Opportunity Corridor study area includes fewer than 3,000 people according to the 2000 Census data. The population of the demographic area was estimated at 14,453.

Table 3-3: Population (2000)

Area	Total Population
Opportunity Corridor study area	2,970
Opportunity Corridor demographic area	14,453
City of Cleveland	478,403
Cuyahoga County	1,393,978
Ohio	**11,353,140**

Source: HNTB; U.S. Census Bureau, 2000

Households

In 2000, there were 5,089 households within the demographic area with fewer people per household (2.25) compared to the city as a whole (2.44). This is due in large part to the number and percentage of one-person households. Over 46% of the demographic area's households were one-person households, compared to 35.2% of the city's households. The percentage of households in the demographic area with individuals under the age of 18 years was 32.7%, which is comparable to the city as a whole (35.0%). The percentage of households in the demographic area with individuals over the age of 65 years was 34.1%, which is greater than that experienced by the city (24.0%).

[2] The available aerial photography used to estimate population may not completely represent residential units "on the ground" and recorded as part of the 2000 U.S. Census. However, based on data from the City of Cleveland and the U.S. Census, the use of this aerial photography likely results in a conservative population estimate due to declining population over time within the study area.

Table 3-4: Household Characteristics (2000)

Area	Total No. of Households	Average Household Size	Households w/ Individuals under 18 yrs	Households w/ Individuals over 65 yrs	One-person Households
Demographic Area	5,089	2.25	1,662	1,735	2,350
			32.7%	34.1%	46.2%
City of Cleveland	190,638	2.44	66,814	45,812	67,177
			35.0%	24.0%	35.2%
Cuyahoga County	571,457	2.39	180,906	155,959	187,395
			31.7%	27.3%	32.8%
Ohio	4,445,773	2.49	1,534,008	1,058,224	1,215,614
			34.5%	23.8%	27.3%
United States	105,480,101	2.59	38,022,115	24,672,708	27,230,075
			36.0%	23.4%	25.8%

Source: HNTB; U.S. Census Bureau, 2000

Occupied Housing Units where No Vehicle is Available

In 2000, approximately 47 percent of the occupied housing units within the demographic area had no vehicle available, nearly double the City's average of 24.6 percent. A greater portion of these occupied housing units were renter occupied, which is consistent with the city, county, state and country averages.

Table 3-5: Occupied Housing Units where No Vehicle is Available (2000)

Area	Total Occupied Housing Units	Owner Occupied – No Vehicles Available	Renter Occupied – No Vehicles Available	Total – No Vehicle Available
Demographic Area	5,006	243	2,105	2,348
		4.9%	42.0%	46.9%
City of Cleveland	190,633	10,513	36,328	46,841
		5.5%	19.1%	24.6%
Cuyahoga County	571,457	21,008	56,997	78,005
		3.7%	10.0%	13.7%
Ohio	4,445,773	122,900	257,279	380,179
		2.8%	5.8%	8.6%
United States	105,480,101	3,165,468	7,695,599	10,861,067
		3.0%	7.3%	10.3%

Source: HNTB; U.S. Census Bureau, 2000

Housing Tenure

In 2000, approximately 73% of the occupied housing units in the demographic study area were renter occupied, compared to 51.5% for the city. The percentage of the county, state and country's population in renter occupied housing units was between approximately 34% and 37% for the same year. This data indicates the relationship between homeownership and stable housing within the demographic area. Research conducted by the National Association of Realtors for the U.S. Census (2006) concluded homeowners move far less frequently than renters. Hence, homeowners are embedded into the neighborhood and community for a longer period of time. This is consistent with challenges such as deteriorated housing conditions and vacant lots, as documented in the *Connecting Cleveland 2020 Citywide Plan.*

Table 3-6: Housing Tenure (2000)

Area	Total Occupied Housing Units	Owner Occupied Housing Units	Renter Occupied Housing Units
Demographic Area	5,006	1,363	3,643
		27.2%	72.8%
City of Cleveland	190,633	92,498	98,135
		48.5%	51.5%
Cuyahoga County	571,457	360,988	210,469
		63.2%	36.8%
Ohio	4,445,773	3,072,514	1,373,259
		69.1%	30.9%
United States	105,480,101	69,816,513	35,663,588
		66.2%	33.8%

Source: HNTB; U.S. Census Bureau, 2000

3.3 Social Environment

3.3.1 Land Use

The study area consists of residential, commercial, industrial and recreational areas. The land use in the study area is extensively mixed and varies from parcel to parcel. For example, residential properties are located immediately adjacent to industrial properties. This area developed prior to the establishment of zoning codes. The City of Cleveland's Existing Land Use map is included in **Figure 3-2, page 15**.

Future development and land use will follow the *Connecting Cleveland 2020 Citywide Plan* recently developed by the City of Cleveland Planning Commission. The plan groups 36 Cleveland neighborhoods (also known as Statistical Planning Areas) into six "districts." The Opportunity Corridor study area includes portions of Districts 3, 4, and 5. The future land use plan focuses on consolidation of land use and elimination of non-compactable usage. The future land use plan within the study area is illustrated in **Figure 3-3, page 16.**

Conceptual Alternatives Impact Assessment

All conceptual alternative alignments would have a limited impact on future land use, because the *Connecting Cleveland 2020 Citywide Plan* was developed in conjunction with the Opportunity Corridor Study. Likewise, the conceptual alternatives were developed to support the City's adopted goals for future land usage through improved access and mobility. The Opportunity Corridor Study was also incorporated into many of the Community Development Corporation (CDC) master plans which were used in developing the Citywide Plan. The conceptual alternate alignments and future land use also support economic development strategies that are being developed by the City of Cleveland and Greater Cleveland Partnership (GCP), the local chamber of commerce. The alternatives impacts on economic development are discussed in further detail in **Section 3.3.3**.

EXISTING LAND USE

CITY PLANNING COMMISSION

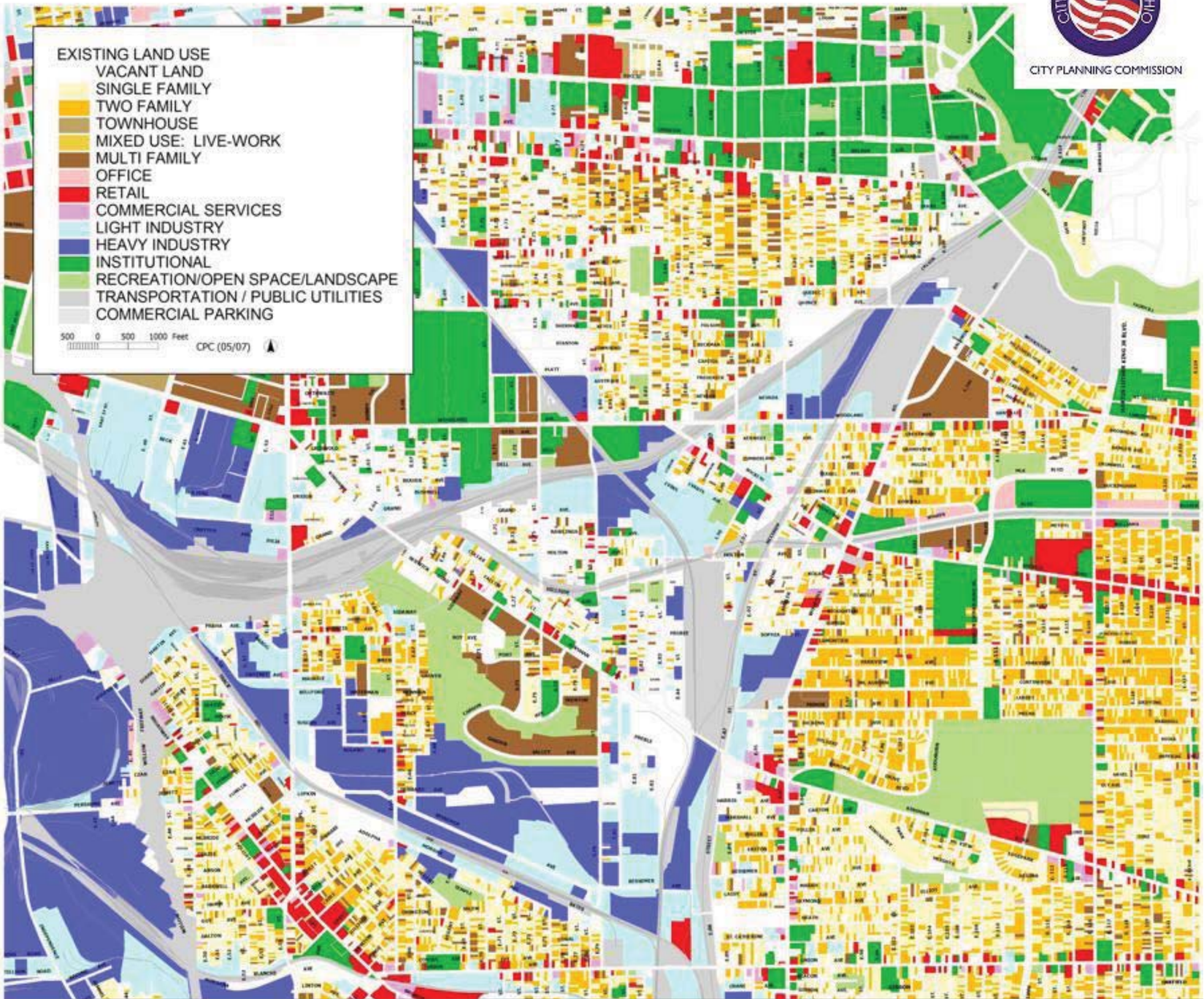


Figure 3-2
City of Cleveland Existing Land Use

PROPOSED LAND USE WITH CONSTRUCTION OF THE OPPORTUNITY CORRIDOR

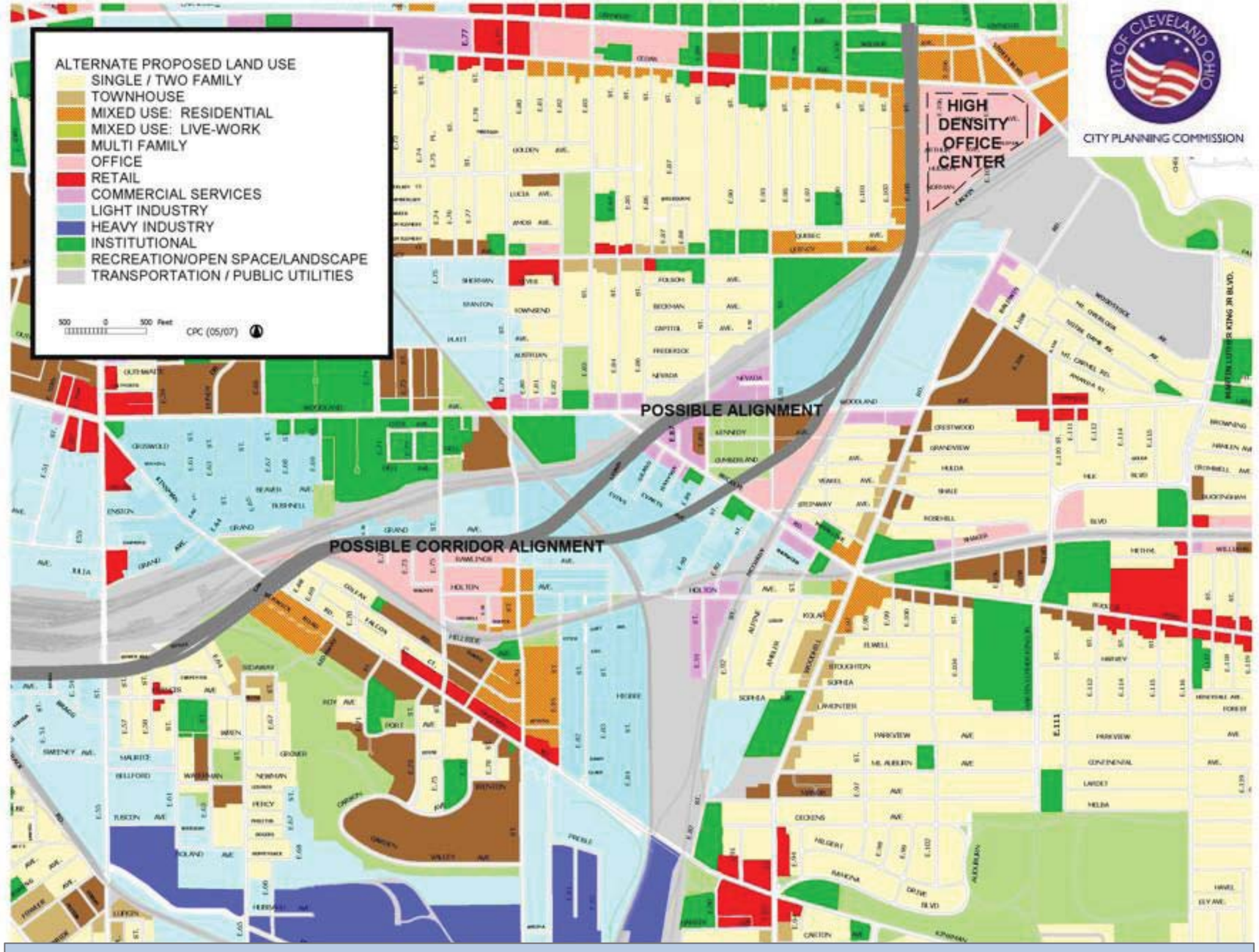


Figure 3-3
City of Cleveland Future Land Use

3.3.2 Displacements and Relocations

A Relocation Assistance Program Survey (RAP) (July 2010) was completed by OR Colan Associates and was submitted to ODOT for review concurrent with this *Conceptual Alternatives Study* document. The relocation study estimates the number of households and businesses to be displaced, the availability of replacement sites, access to community facilities, the overall impact on the housing market and relocation costs for each of the Step 5 alternatives. The report concludes that, regardless of the alternative chosen, the project would improve access to the southeastern end of the City of Cleveland as well as support the revival and redevelopment of large tracks of vacant industrial and residential land. Based on market-based assessment of real estate listings completed as part of the RAP, there are an adequate number of available housing units throughout the surrounding project area for displaced residential occupants and a sufficient amount of available commercial space for most of the businesses that would be affected by the proposed project. Both residents and the majority of businesses should be able to continue living and operating in the area, if they choose. Businesses of concern are salvage yards, which would need to be relocated to a property with the appropriate zoning for this type of business to continue. In order to facilitate these types of relocations, the appropriate City officials and departments would need to be contacted to determine specific zoning requirements that would be necessary in order to continue this type of operation within the municipal limits of the City of Cleveland. If necessary, the acquisition of right-of-way and associated relocation services for the proposed Opportunity Corridor project is estimated to take no more than 24 months.

Conceptual Alternatives Impact Assessment

Structure takes for each alternate within each geographic section are included as **Figure 3-4, Appendix A**. Due to the general economic downturn, as well as population exodus from the City of Cleveland, vacancy rates have generally increased within the study area since the Opportunity Corridor Study began in 2004. Due to the City's enhanced focus on the removal of vacant and abandoned structures, ongoing demolition of buildings in and around the study area has occurred during this time frame. Field inventory of commercial and residential structures was last performed in February 2010 and illustrated on the figures. Impacted structures counts for each alternate are included in the evaluation matrix contained in **Appendix B**. It is noted that displacement totals discussed below are related to, but independent of, the structure impacts. Abandoned and boarded-up structures are included in the structure take counts, but are not included in the displacement totals since there would be no individual or business to receive relocation benefits. Structure impacts also represent the number of residential and commercial buildings potentially impacted while displacements tally the total number of units, taking into account the presence of multi-unit residential structures or multiple businesses sharing a structure. All relocations would occur in identified environmental justice areas and are likely to impact environmental justice populations.

Table 3-7 summarizes estimated displacements for each alternate within each of the geographic sections, while **Table 3-8** summarizes the estimated right-of-way acquisition and relocation costs.

Table 3-7: Potential Displacements

Section		Alternate A	Alternate B	Alternate C
West	Residential Units (owner occupied / tenant occupied)	58 (16/42)	48 (12/36)	77 (25/52)
	Business*	3	6	3
Central	Residential Units (owner occupied / tenant occupied)	7 (1/6)	11 (2/9)	18 (9/9)
	Business*	13	12	4
East	Residential Units (owner occupied / tenant occupied)	11 (5/6)	14 (3/11)	6 (1/5)
	Business*	4	2	2

*Represents for profit and non-profit (i.e., churches) businesses

Source: Opportunity Corridor Relocation Assistance Program Survey, O.R. Colan Associates, Inc., July 2010.

Table 3-8: Estimated Right-of-Way Acquisition and Relocation Costs

Section	Alternate A	Alternate B	Alternate C
West	$5,122,000	$6,210,500	$7,117,400
Central	$12,189,500	$12,748,000	$9,917,400
East	$3,372,500	$3,138,000	$2,781,500

Source: Opportunity Corridor Relocation Assistance Program Survey, O.R. Colan Associates, Inc., July 2010; Conceptual Project Cost Estimates for the Opportunity Corridor, B&N, July 13, 2010.

3.3.3 Economic Development

The purpose of the Opportunity Corridor project is to create the transportation infrastructure to support the revival and redevelopment within the study area and surrounding area. The City of Cleveland and Greater Cleveland Partnership (GCP) are working together to develop an economic development plan for the project study area that is consistent with and supports *Connecting Cleveland 2020 Citywide Plan.* As part of the planning process, the City and GCP developed the Community Benefit Area (CBA) to begin to identify and track benefits to surrounding neighborhoods. The CBA was defined in a manner to measure benefits to nearby residents, as well as connect to and support existing development in the surrounding neighborhoods.

The City of Cleveland Planning Commission also created Opportunity Corridor Development Districts identifying areas in which the Opportunity Corridor transportation improvement could support economic activity. A figure illustrating these districts is included in **Figure 3-5, page 18**. The City is working with the Community Development Corporations (CDC) to identify specific development activities within each of the development districts based on current development, future land use and neighborhood level plans incorporated into the Citywide Plan. A key outcome of this effort will be to determine how future planned development would fit in with and support the surrounding community(s). Additionally, the City will be coordinating with real estate and economic advisors to establish a plan for development and re-development that is realistic and truly reflective of what the Development Districts can feasibly support.

Some of the goals that have been established by the City in creating economic activity, as described in the City's *Connecting Cleveland 2020 Citywide Plan* and CDC plans, include the following:

- Clean-up and reuse Brownfield sites
- Reuse, demolish, and reconstruct abandoned buildings
- Retain, support, or expand existing businesses, institutions, and local community developments
- Improve job opportunities for local residents
- Strengthen and improve the quality of neighborhoods in the CBA

Conceptual Alternatives Impact Assessment

Because it is intended to support planned development and redevelopment within the study area, the project is being closely coordinated with the efforts of the City of Cleveland and GCP. ODOT will continue this coordination as the project advances through the Project Development Process. All of the conceptual alternate alignments would improve the economic development potential for the Development Districts identified and established by the City of Cleveland. For the districts adjacent to, or intersected by the proposed boulevard, improvements would include enhanced mobility, direct access to freeways and the University Circle area, new frontage, improved visibility, and improved multi-modal access. For districts in proximity to the proposed boulevard, more direct, less circuitous routing to sites via the proposed boulevard would be available.

3.3.4 Community Facilities and Resources

The following sections provide an inventory of community facilities and services within the study area, as well as a preliminary assessment of potential direct impacts based on the conceptual alternatives. An attempt was also made to identify other facilities and resources near the project that had the potential to serve persons living or working within the study area. **Figure 3-6, Appendix A** also shows the locations of these resources relative to the study area.

Due to the conceptual nature of the alternatives detailed in this report, a preliminary assessment of the proposed project's potential effects was conducted. Potential effects of the proposed project will be further evaluated, as necessary, as the project is advanced through subsequent planning and design phases.

OPPORTUNITY CORRIDOR DEVELOPMENT DISTRICTS

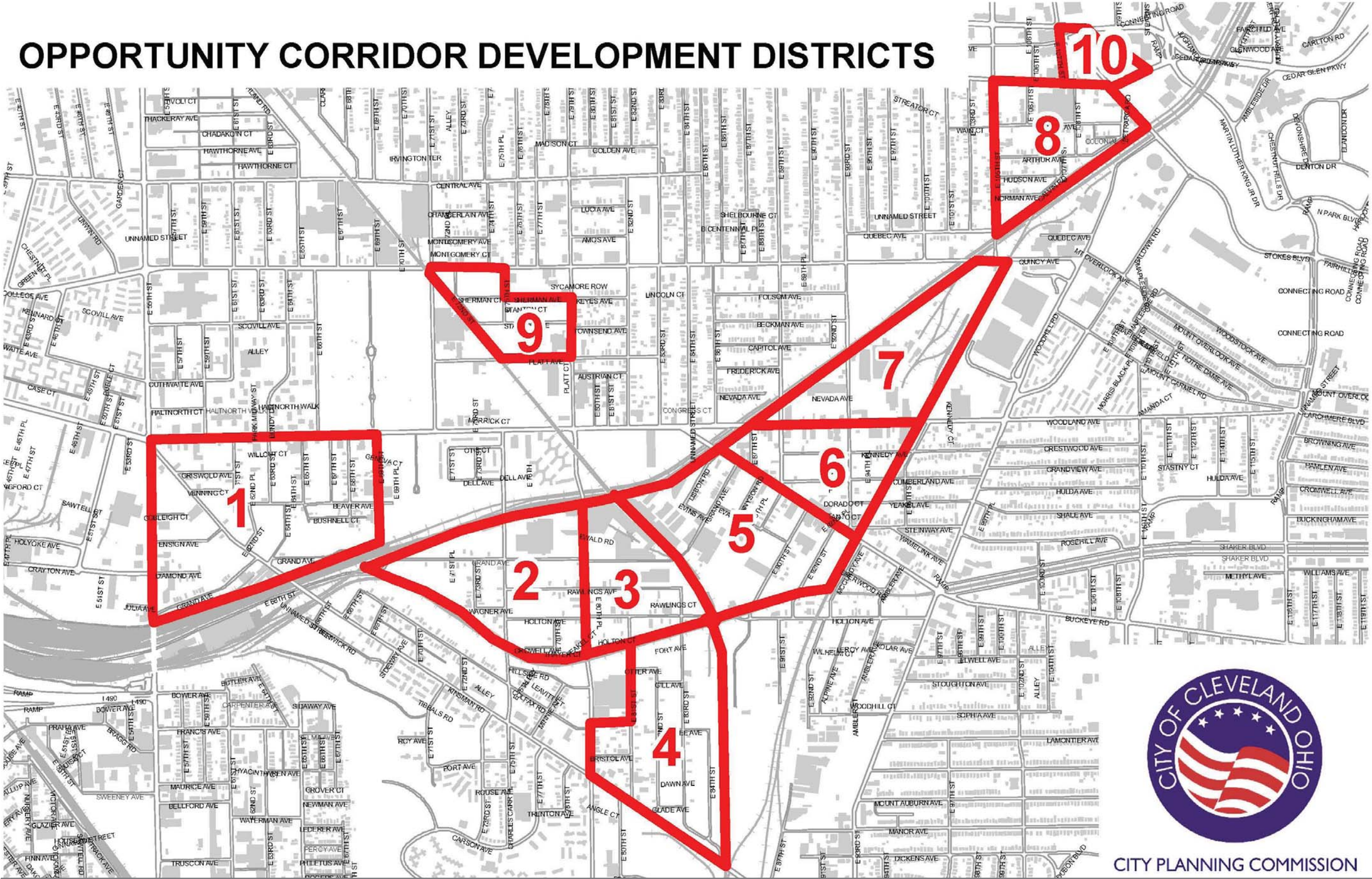


Figure 3-5
Opportunity Corridor Development Districts

3.3.4.1 Parks and Recreational Facilities

There are two park district facilities located within the study area:

- Kenneth Johnson (Woodland) Recreation Center - located at 9206 Woodland Avenue - includes a gymnasium, outdoor pool, outdoor playground, indoor weight room, computer lab, and meeting room facilities[3]. According to the *Kenneth Johnson Recreation Center Master Plan* dated November 2004[4], an expansion of the facility is planned by the City of Cleveland. A copy of the adopted Master Plan obtain from the City of Cleveland's website is located in **Figure 3-7, page 20.** This planned expansion would include additional indoor and outdoor recreational facilities that would comprise the majority of parcels bounded by E. 89th Street, Woodland Avenue, E. 93rd Street, and Buckeye Avenue. The total area of the recreation center after the planned expansion would be approximately 11.7 acres. According to the expansion plans, pockets of commercial and institutional use would remain in the very northwest corner, eastern central periphery, and southeast corner. At the time of this assessment, there was no identified funding or timeline associated with the planned expansion.
- Dell Playground is located at southeast quadrant of E. 75th Street and Dell Avenue. According to the City of Cleveland Parks, Recreation and Properties website, the Dell Playground is approximately 1.3 acres and consists of a playground and full-court basketball surface.

The Eberhard Playground was located at the southwest quadrant of E. 90th Street and Evarts Road. However, this facility has been closed, and the land has been sold to Miceli Dairy for plant expansion. The City of Cleveland's online Geographic Information System (GIS) information system (http://planning.city.cleveland.oh.us/gis/cpc.html, accessed April 2010) was used to confirm that the land is no longer owned by the City of Cleveland.

The following facilities are located outside the study area, but could serve those living or working within the study area:

- Lonnie Burton Recreation Center – Located at 2511 E. 46th Street
- Gassaway Pool – Located at 2306 E. 100th Street
- Fairfax Recreation Center – Located at 2335 E. 82nd Street
- Port Park – Located on E. 73rd Street south of Kinsman
- Outlook Playground – Located south of E. 59th Street/Woodland Avenue intersection
- Drake Tot Lot – Located at E. 68th Street south of Woodland Avenue

Conceptual Alternatives Impact Assessment

Based on the conceptual alternate alignments, no physical encroachment or permanent access impacts to Dell Playground or any of the park and recreation facilities located outside of the study area are anticipated as a result of the Opportunity Corridor project.

Physical encroachment or permanent access impacts to existing recreational facilities associated with the Kenneth Johnson Recreation Center are not anticipated with any of the conceptual alternatives. However, based on the Center's adopted Master Plan[5], each of the conceptual alternatives would directly impact parcels associated with the planned recreation center expansion. Additionally, proximity impacts could also occur in some areas not directly impacted. A summary of these potential effects is included in **Table 3-16,** which can be found in the Section 4(f) discussion of this report.

In order to minimize impacts to the planned recreation center expansion, ODOT will continue to coordinate with the City of Cleveland during the planning and design of the proposed Opportunity Corridor project to ensure that consideration of the planned expansion of the Kenneth Johnson Recreation Center is considered in the design of the project.

3.3.4.2 Schools

There are two Cleveland Metropolitan School District (CMSD) city-wide draw schools located within the study area. These facilities include:

- John Hay Campus High School – Located at 2075 Stokes Boulevard
- Cleveland School of the Arts (CSA) High School – Located at 2064 Stearns Road

According to information provided by CMSD, the attendance areas for the following schools extend into the study area:

- Early Childhood Development Center at Charles Orr – Located at 9711 Lamont Avenue
- Bolton Elementary School – Located at 9803 Quebec Avenue
- Giddings Elementary School – Located at 2250 E. 71st Street
- Buckeye-Woodland Elementary School – Located at 9511 Buckeye Road
- Anton Grdina Elementary School – Located at 3050 E. 77th Street
- Willow Elementary School – Located at 5004 Glazier Avenue
- East Technical Campus High School – Located at 2439 E. 55th Street

According to a representative from CMSD, there are no regular bus routes for these facilities, because they are neighborhood schools. Students living within two miles of the school are not provided transportation by CMSD. However, certain categories of special education are transported by CMSD. CMSD indicates that the frequency of transporting special education students to school is low.

There is one private school located in the study area:

- Progressive Baptist Bible Institute (formerly American Baptist College) – 7209 Woodland Avenue.

There are three private schools located adjacent to the study area:

- Benedictine High School – Located at 2900 Martin Luther King Drive;
- Holy Trinity Roman Catholic School – Located at 7209 Woodland Avenue; and
- St. Adalbert Parish School – Located at 2345 E. 83rd Street.

The main campus of Case Western Reserve University (CWRU) is located outside of the study area.

Conceptual Alternatives Impact Assessment

No permanent access or physical encroachment impacts to these school facilities are anticipated with any of the conceptual alternatives. Residential relocations resulting from the conceptual alternatives could change the student enrollment numbers and demographic composition of the schools. Since there are no regular bus routes for schools serving the study area, impacts to bus services are not anticipated. Transportation of special education students, if any within the study area, could experience temporary impacts in the form of delays associated with construction activities. Students wishing to walk to/from school may need to cross intersecting roadways which are proposed for widening and/or are projected to have increased traffic volumes on them as a result of the proposed project. The design of the Opportunity Corridor project will include consideration of appropriate pedestrian crossings and intersection improvements to facilitate these pedestrian movements.

Potential effects to school facilities will be further evaluated, as necessary, as the project is advanced through subsequent planning and design phases.

[3] City of Cleveland Parks and Recreation Properties Department website, (http://www.city.cleveland.oh.us/clnd_images/Parks/recreation/rec_centers.pdf, accessed April 2010).
[4] City Planning Commission website, (http://planning.city.cleveland.oh.us/cwp/other/KenJohnsonRecCenterPlan.pdf, accessed April 2010).
[5] http://planning.city.cleveland.oh.us/cwp/other/KenJohnsonRecCenterPlan.pdf, accessed May 2010.

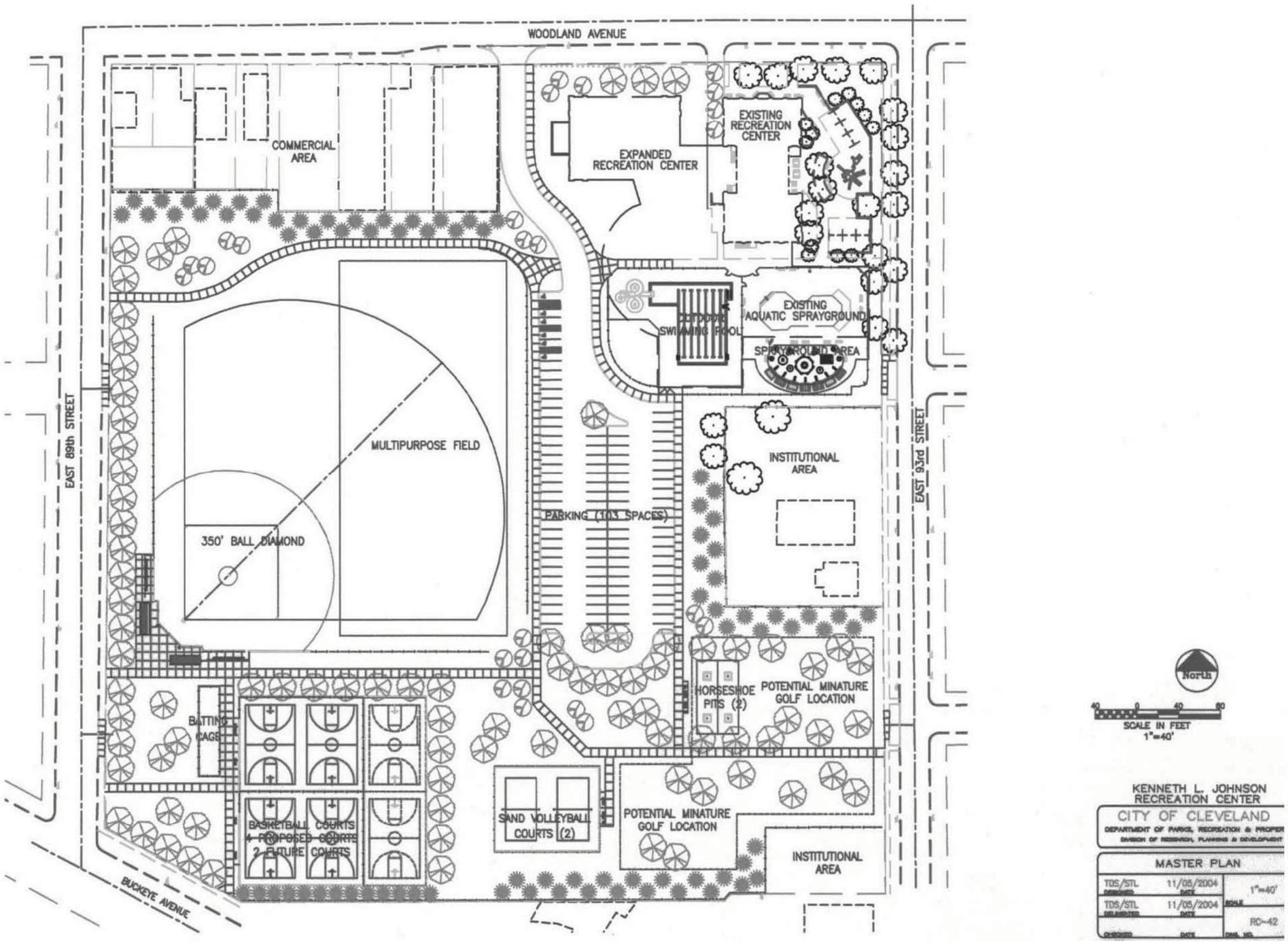


Figure 3-7
Ken Johnson Recreation Center
Master Plan

3.3.4.3 Churches

According to field observations from a February 2010 site visit, the following thirty-five churches are located in the study area:

- Balm in Gilead Missionary Baptist Church - Located at 10820 Frank Avenue
- Blessed Hope Missionary Baptist Church - Located at 8804 Buckeye Road
- Calvary Apostolic Assembly - Located at 2781 Ambler Avenue
- Calvary Hill Baptist Church - Located at 10300 Cedar Avenue
- Christ Centered Missionary Baptist Church - Located at 2198 E. 105th Street
- Church Ekklesia - Located at 6005 Francis Avenue
- Church of God and Saints of Christ - Located at 8117 Woodland Avenue
- Community Missionary Baptist Church - Located at 9903 Quincy Avenue
- Elizabeth Baptist Church - Located at 8005 Holton Avenue
- Faith Holiness Temple - Located at 9105 Woodland Avenue
- Good Shepherd Evangelistic - Located at 2826 E. 79th Street
- Greater Mt. Tabor Missionary Baptist Church - Located at 2646 E. 93rd Street
- Greater Roman Baptist Church - Located at 8715 Buckeye Road
- Kingdom of Life Assembly Church - Located at 2570 Woodhill Avenue
- Kinsman Avenue Church of God - Located at 6902 Kinsman Road
- Lily Baptist Church - Located at 10714 Cedar Avenue
- Mt. Hebron Missionary Baptist Church - Located at 2227 E. 105th Street
- Mt. Olive Jerusalem Missionary Baptist Church - Located at 3290 E. 126th Street
- Mt. Sinai Baptist Church - Located at 7510 Woodland Avenue
- New Mount Zion Primitive Church of God - Located at 7021 Colfax Avenue
- New Zion Gospel Church - Located at 2747 E. 90th Street
- Open Door Missionary Baptist Church - Located at 8215 Woodland Avenue
- Original Harvest Missionary Baptist Church - Located at 7101 Kinsman Road
- Saint Adalbert Church - Located at 2347 E. 83rd Street
- Saint Ann Deliverance Tabernacle Church - Located at 7804 Holton Avenue
- Second Bethlehem Baptist - Located at 2204 Petrarca Avenue
- St. Elizabeth of Hungary Roman Catholic Church - Located at 9016 Buckeye Road
- St. Teressa Holiness Science Church - Located at 7243 Kinsman Road
- The Pentecostal Church of Christ - Located at 10515 Chester Avenue
- The Temple Tifereth Israel - Located at 1855 Ansel Road
- Union Hill Missionary Baptist Church - Located at 8021 Rawlings Avenue
- United Glorious Church of God in Christ of the Apostolic Faith - Located at 2682 E. 93rd Street
- Universal Hagars Spiritual Church - Located at 8017 Rawlings Avenue
- University Circle United Methodist Church (also referred to as Epworth Euclid Methodist Church in the Phase I History/Architecture Survey) - Located at 1919 E. 107th Street
- Uqbah Mosque Foundation - Located at 2222 Stokes Boulevard

Conceptual Alternatives Impact Assessment

No direct physical encroachment or permanent access change impacts to church facilities are anticipated as a result of the West Section alternates.

Central Alternates A and B would displace the Greater Roman Baptist Church (located along Buckeye Road) and the Faith Holiness Temple (located along Woodland Avenue). Central Alternate C would not directly impact any churches.

East Alternate A would displace the Christ Centered Missionary Baptist Church.

Church facilities in the immediate area of the proposed roadway improvements may also experience temporary noise and access impacts from adjacent construction activities. The proximity of the proposed boulevard could complicate access to churches. Vehicular, bicycle and pedestrian access considerations would need to be evaluated for build alternates.

3.3.4.4 Cemeteries

There are two cemeteries located within the boundaries of the study area:

- St. Joseph Cemetery – Located at 7916 Woodland Avenue
- Woodland Cemetery – Located at 6901 Woodland Avenue

Conceptual Alternatives Impact Assessment

No permanent access or physical encroachment impacts to the St. Joseph Cemetery and the Woodland Cemetery are anticipated with any of the proposed Opportunity Corridor conceptual alternatives.

Temporary impacts to the St. Joseph Cemetery would only occur if a rail runaround is required to facilitate construction of the proposed Opportunity Corridor under the Norfolk Southern Cleveland rail line. Due to the proximity of adjacent structures, the need for this temporary construction measure is not anticipated.

Depending on the projected traffic volumes, there is potential for increased traffic noise in the area of the cemeteries due to increased traffic volumes on feeder roadways such as E. 79th Street. These potential effects will be further evaluated, if necessary, as the project is advanced through subsequent planning and design phases.

3.3.4.5 Libraries

There is one branch of the Cleveland Public Library within the study area:

- The Martin Luther King, Jr. Branch - Located at 1962 Stokes Boulevard

There are three branches of the Cleveland Public Library that serve those living and working in the study area:

- The Rice Branch – Located at 11535 Shaker Boulevard
- The Woodland Branch – Located at 5896 Woodland Avenue
- Garden Valley Branch – Located at 7201 Kinsman Road

Conceptual Alternatives Impact Assessment

No permanent access or physical encroachment impacts to public library facilities are anticipated with any of the proposed Opportunity Corridor conceptual alternatives.

3.3.4.6 Cuyahoga Metropolitan Housing Authority (CMHA)

The Cuyahoga Metropolitan Housing Authority (CMGA) operates the following facilities within the study area:

- Garden Valley – Located at 7102 Port Avenue (portions within study area)

There are several other CMHA facilities that may serve the study area, including the following:

- Carver Park – Located at 2370 Unwin Avenue
- Outhwaite Homes Estates – Located at 4840 Scovill Avenue
- Delaney Village and Renaissance Village (King Kennedy Family Estate) – Located at 6001 Woodland Avenue
- King Kennedy North High Rise – Located at 2501 E. 59th Street
- Phoenix Village – Scovill Avenue at E. 59th Street

- Woodhill Homes Estates – Located at 2567 Woodhill Avenue

Conceptual Alternatives Impact Assessment

No direct physical encroachment or permanent access change impacts are anticipated to the CMHA Garden Valley development as a result of the proposed Opportunity Corridor conceptual alternatives. The Kinsman Road approaches are proposed to be widened as part of the Opportunity Corridor project. Residents of Garden Valley wishing to walk to/from local businesses may need to cross intersecting roadways, such as Kinsman Road, which are proposed for widening and/or are projected to have increased traffic volumes on them as a result of the proposed project. The design of the Opportunity Corridor project will include consideration of appropriate pedestrian crossings and intersection improvements to facilitate these pedestrian movements.

No impacts to the CMHA facilities located outside of the study area are anticipated.

3.3.4.7 Other Facilities

There are no post offices located within the study area. There are three post offices located in the vicinity, but outside, the study area:

- University Center Station Post Office – Located at 1950 E. 101st Street
- Jesse Owens Station Post Office – Located at 5600 Woodland Avenue
- Willow Station – Located at E. 55th Street and Broadway

The Cuyahoga County Juvenile Justice Center is located just outside the study area on the southeast corner of E. 93rd Street and Quincy Avenue.

The King Kennedy Boys and Girls Club is located outside the study area at 2561 E. 59th Street.

The Quincy Place Community Center, located at 8111 Quincy Avenue (outside of the study area), houses Cuyahoga County social services offices, a day care center, and a host of other community services. The building also houses the offices of the Fairfax Renaissance Development Corporation.

There is one cultural facility within the study area:

- The Children's Museum of Cleveland – Located at 10730 Euclid Avenue

There are several cultural facilities located just outside the study area, including:

- Cleveland Play House – Located at 8500 Euclid Avenue
- Cleveland Museum of Contemporary Art – Located at 8501 Carnegie Avenue
- Karamu House – Located at 2355 E. 89th Street
- Cleveland Orchestra Severance Hall – Located at 11001Euclid Avenue

Conceptual Alternatives Impact Assessment

The facilities listed above are all located beyond the areas of the proposed roadway improvements. Consequently, no direct physical encroachment or permanent access change impacts are anticipated with any of the proposed Opportunity Corridor conceptual alternatives.

3.3.5 Public Safety and Emergency Services

3.3.5.1 Fire Stations, Police Stations, EMS

The study area is located within two of the Districts of the City's Division of Police (Third District and Fourth District). There is one police station located within the study area:

- Third District Station – Located at 10700 Chester Avenue

There is one police station located outside the study area that provides police protection services to persons within the study area:

- Fourth District Station – Located at 9333 Kinsman Road

The Cuyahoga Metropolitan Housing Authority (CMHA) Police Department, located at 5715 Woodland Avenue, is also located outside the study area. .

The study area is primarily located within two of the Battalions of the City's Division of Fire (Battalions 1 and 2). There is one fire station facility located within the study area:

- Fire Station #10 – Located at 1935 E. 101st Street

There are 5 fire stations within Battalions 1 and 2 that could also provide fire protection services to the study area:

- Fire Station #7 – Located at 3636 Woodland Avenue
- Fire Station #9 – Located at 6712 Woodland Avenue
- Fire Station #13 – Located at 4950 Broadway
- Fire Station # 17 – Located at 1918 E. 66th Street
- Fire Station #26 – Located at 7818 Kinsman Road

Staff from the City of Cleveland's Division of Emergency Medical Services indicated that emergency medical services (EMS) are not tied or explicitly linked to geographic areas of coverage; therefore, EMS vehicles and personnel do not operate from defined districts or battalions. They are deployed during shifts and constantly subject to relocation by dispatchers based upon need over the course of each day.

Conceptual Alternatives Impact Assessment

No permanent access or physical encroachment impacts to fire stations, police stations, and EMS facilities are anticipated as a result of the Opportunity Corridor project. It is possible that response times for police, fire, and EMS services would increase temporarily during construction of the proposed project. However, the proposed Opportunity Corridor would improve east-west mobility, as well as improve local access and connectivity between I-77/I-490, University Circle hospitals, the University Circle neighborhood, and other neighborhoods in between. This enhanced access and connectivity should have a positive effect on police, fire, and EMS response times.

Potential effects to fire, police, and EMS response times will be further evaluated, as necessary, as the project is advanced through subsequent planning and design phases.

3.3.5.2 Hospitals and Health/Human Service Related Facilities

Hospitals and health/human service related facilities in the study area are concentrated in the University neighborhood, with a few facilities located to the west of University Circle in the Fairfax neighborhood. Facilities within the study area include:

- The Cleveland Clinic Foundation, including the following:
  - Cole Eye Institute – Located at E. 100th Street and Euclid Avenue
  - Crile Building (Building A) – Located at 2049 E. 100th Street
  - W. O. Walker Cancer Center – Located at 10524 Euclid Avenue
  - Multiple parking facilities
- Cleveland Society for the Blind Sight Center – Located at 1909 E. 101st Street
- Ronald McDonald House – Located at 10415 Euclid Avenue
- American Cancer Society – Located at 10501 Euclid Avenue
- Hospice of Western Reserve – Located at 10645 Euclid Avenue
- Senior Outreach Services – Located at 2390 E. 79th Street

University Hospitals of Cleveland (multiple medical facilities) is located outside the study area to the east.

According to the 2009 U.S. News & World Report's Best Hospitals Ranking[6], the Cleveland Clinic and University Hospitals are recognized as two of the best hospitals in the Country. Of the 4,861 facilities analyzed in 2009, only 174 hospitals were ranked in any of the 16 adult specialties. Only 56 facilities were ranked in at least one of the ten pediatric specialties. University Hospital's Case Medical Center was ranked in six adult and eight pediatric specialties. The Cleveland Clinic Foundation was ranked in 15 adult and eight pediatric specialties, including a top

[6] http://health.usnews.com/, accessed May 2010.

ranking in heart and heart surgery. The prominence of these two facilities makes them a regional, and perhaps a national, destination.

There are also a few health/human service related facilities and organizations located outside the study area that could potentially serve persons living and working in the study area. These facilities include, but may not be limited to, the following:

- Cleveland Clinic Children's Hospital – Located at 9500 Euclid Avenue
- Lerner Research Institute (Cleveland Clinic Foundation) – Located at 2123 E. 96th Street
- Otis Moss Jr. Health Center – Located at 8819 Quincy Avenue
- The Louis Stokes Veterans Administration Medical Center – Located at 10701 East Boulevard

Conceptual Alternatives Impact Assessment

No structure takes are anticipated for any of the hospitals and health/human service facilities in the study area. It is anticipated that potential impacts to hospitals and health/human service related facilities in the study area would be limited to right-of-way acquisition associated with proposed improvements to E. 105th Street. The conceptual design plans indicate that right-of-way would need to be procured from the parcels containing the following facilities: Cleveland Clinic Society for the Blind Sight Center, the Ronald McDonald House, the American Cancer Society, Cleveland Clinic Cole Eye Institute and Crile Building, and W.O. Walker Cancer Center.

Access to hospitals and health/human service facilities could also be temporarily affected during construction of the proposed project.

As discussed previously, the proposed Opportunity Corridor is expected to have a positive effect on EMS access and mobility due to the enhanced ability to transport individuals from the North Broadway and Kinsman neighborhoods to hospital facilities in the University neighborhood via a more direct route than is currently available.

3.3.6 Environmental Justice

Environmental Justice (EJ) communities are areas where there is a higher percentage of low income or minority populations.

Environmental justice analysis is consistent with guidance provided by FHWA and regulatory guidance developed by Ohio Department of Transportation, "Guidance and Best Practices for Incorporating Environmental Justice into Ohio Transportation Planning and Environmental Processes" (ODOT, 2002). Additional regulations relevant to environmental justice and guiding this study are:

- Applicable Laws and Executive Orders
  - Civil Rights Act of 1964, Title VI (42 USC 2000d et seq.)
  - National Environmental Policy Act of 1969 (42 USC 4321 et seq.)
  - Clean Air Act of 1990 (42 USC 7609)
  - Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (1994)
  - Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency (2000)
- Regulatory Guidance and Policy
  - CEQ Environmental Justice Guidance Under NEPA
  - EPA Guidance for Consideration of Environmental Justice in Clean Air Act Section 309 Reviews
  - FHWA Technical Advisory 6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents
  - FHWA Order 6640.23, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The following steps were taken to identify environmental justice populations and determine preliminary impacts of the conceptual alternatives on environmental justice populations:

- Preliminary identification of environmental justice populations was made using data from the 2000 Census Data published by the U.S. Bureau of the Census. Unless otherwise noted, data for this document originated from the U.S. Bureau of the Census.
- Population totals of the Opportunity Corridor study area were determined at the Census Block level. This data yielded a year 2000 population estimate of 2,970. For low-income and minority populations, demographic characteristics were determined at the Block Group level because income data is not available at the Census Block level and for comparative purposes to the reference population of the City of Cleveland.
- The identified environmental justice populations within the demographic area were compared to the reference population, the City of Cleveland. For the most part, this demographic area consists of six distinct neighborhoods, generally represented by the statistical planning areas identified in **Figure 3-8, page 24**. These neighborhoods include Fairfax, Kinsman, North Broadway (Slavic Village), Buckeye, University Circle, and Central. This comparison is for illustrative purposes only and is not used to determine whether or not project impacts are disproportionate.
- A pair of public meetings, five community meetings, and a business meeting were conducted in September 2009. In addition, interviews were conducted with business owners, employees, patrons and residents within the study area.
- The data gathered from the above listed public involvement activities was analyzed and is being used to refine future public involvement activities. This is being summarized in an update to the *Public Involvement Plan* to ensure inclusiveness of environmental justice populations. Additional information regarding public involvement is contained in **Section 4**.

3.3.6.1 Affected Environment

For determining the area of potential impact for environmental justice populations, the following ODOT guidance was reviewed:

"*Identification of the geographic area likely to be impacted by particular programs or activities will vary depending on their purpose… if the program or activity is dedicated to a specific project area or corridor, then the geographic area for the EJ analysis would include, at a minimum, all areas within the logical termini of the project area as well as adjacent areas that may reasonably be impacted." (ODOT, 2002).*

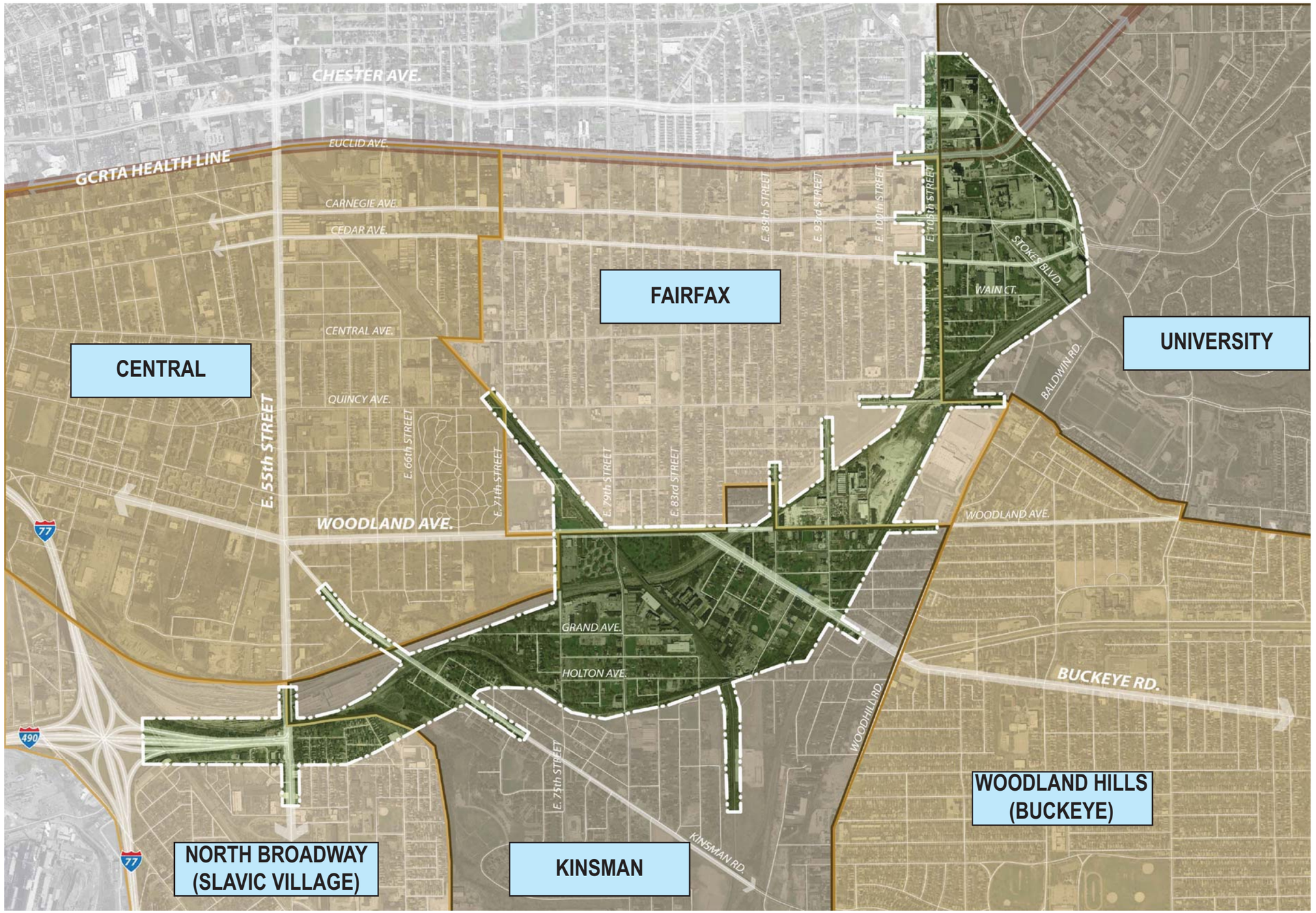
For the purposes of the Opportunity Corridor project, the study area **(See Figure 1-1, page 3)** is defined where project activities will occur, including proposed displacement of residences and businesses, road construction, and property acquisition. As a facility though, the proposed Opportunity Corridor project will serve a much larger area than just where the construction activities and operational changes will occur. Therefore, the demographic area (see **Section 3.2.1**) was used for identifying and determining the characteristics of environmental justice populations.

Population totals were identified above in **Section 3.2.1**. 2000 U.S. Census Block data yielded an estimated population of less than 3,000 people living within the Opportunity Corridor study area and 14,453 living within the demographic area. The environmental justice analysis for the affected environment describes the environmental justice populations within the demographic area, rather than the study area.

3.3.6.2 Race & Ethnicity

As specified by FHWA and ODOT guidance, minority populations were defined as individuals listed in the 2000 Census as considering themselves to be non-white (Black or African American, American Indian and Alaskan Native, Asian, Pacific Islander, or other race) or Hispanic or Latino (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

In 2000, 69 percent of the persons living in the demographic area were African American, compared to 51 percent for the City of Cleveland as a whole. Thirteen of the nineteen Block Groups comprising the demographic area have African American populations that are greater than 90% of the total population within the Block Group **(see Table 3-9, Race and Ethnicity, and Figure 3-9, page 26).** This is a notable percentage increase as compared to African American population percentage within the City of Cleveland (51 percent). In addition, when compared to the City of Cleveland, fewer people (as a percentage of the total population) within the demographic area are of some other race, two or more races, or Hispanic origin.



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NOT TO SCALE

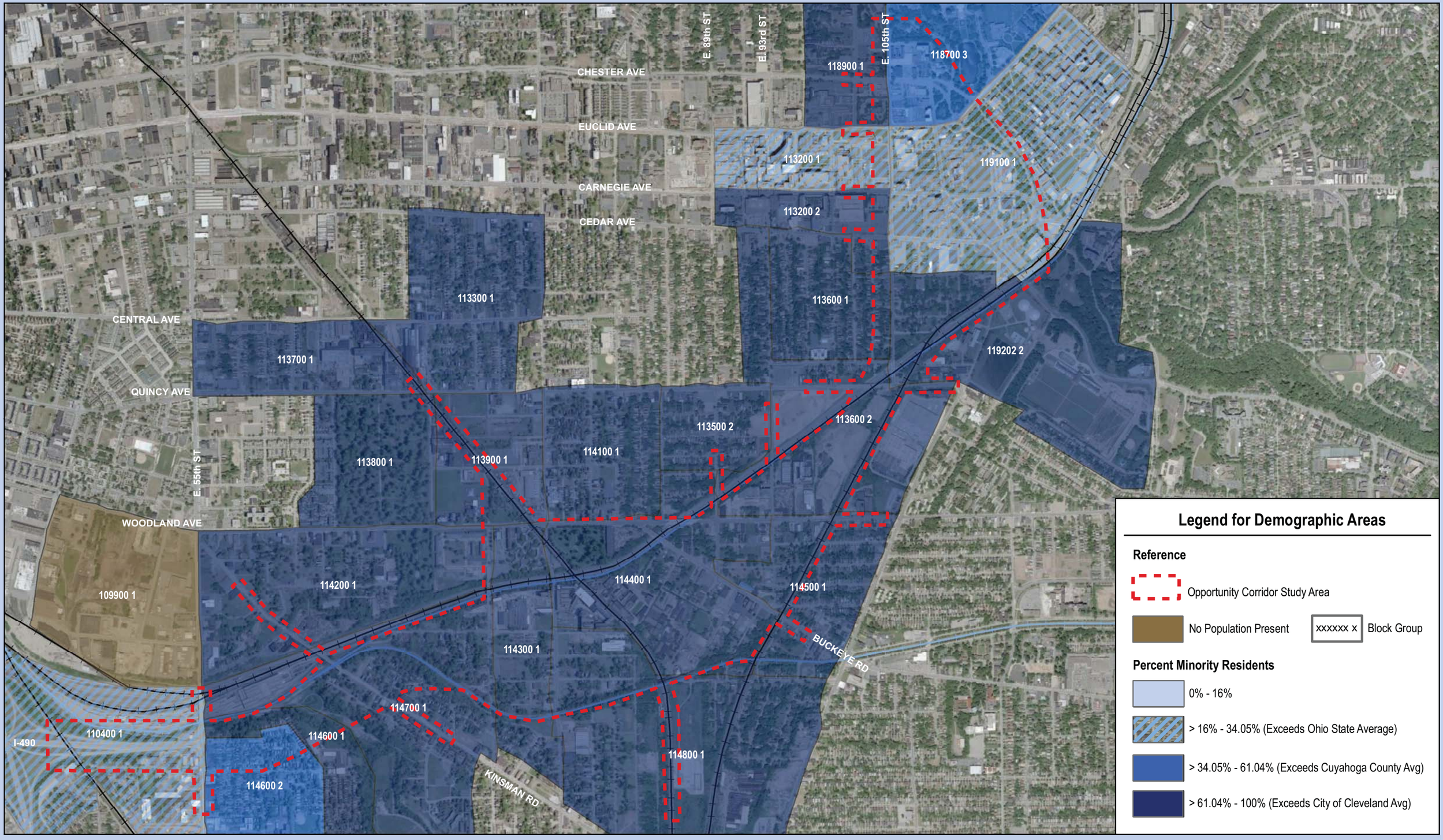
NORTH

Figure 3-8
Statistical Planning Areas

Table 3-9: Race and Ethnicity, Block Groups 2000

Geographic Area	Total Population	White		Black or African American		American Indian and Alaska Native		Asian		Native Hawaiian and Other Pacific Islander		Some Other Race		Population of Two or More Races		Hispanic or Latino	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
United States	281,421,906	211,460,626	75%	34,658,190	12%	2,475,956	1%	10,242,998	4%	398,835	0.1%	15,359,073	5.5%	6,826,228	2.4%	35,305,818	13%
Ohio	11,353,140	9,645,453	85%	1,301,307	11%	24,486	0%	132,633	1%	2,749	0.0%	88,627	0.8%	157,885	1.4%	217,123	2%
Cuyahoga County	1,393,978	938,863	67%	382,634	27%	2,529	0%	25,245	2%	338	0.0%	20,962	1.5%	23,407	1.7%	47,078	3%
Cleveland	478,403	198,510	**41%**	243,939	**51%**	1,458	**0%**	6,444	**1%**	178	**0.0%**	17,173	**3.6%**	10,701	**2.2%**	34,728	7%
Demographic Area																	
CT 1104, BG 1	199	148	74%	34	17%	3	1.5%	0	0.0%	0	0.0%	9	4.5%	5	2.5%	17	8.5%
CT 1132, BG 2	298	3	1%	291	**97.7%**	1	0.3%	0	0.0%	0	0.0%	1	0.3%	2	0.7%	0	0.0%
CT 1135, BG 2	525	4	1%	503	**95.8%**	1	0.2%	2	0.4%	0	0.0%	1	0.2%	14	2.7%	9	1.7%
CT 1136, BG 1	1,079	6	1%	1,047	**97.0%**	0	0.0%	3	0.3%	0	0.0%	2	0.2%	21	1.9%	8	0.7%
CT 1136, BG 2	408	9	2%	393	**96.3%**	1	0.2%	0	0.0%	0	0.0%	0	0.0%	5	1.2%	5	1.2%
CT 1139, BG 1	71	0	0%	70	**98.6%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.4%	0	0.0%
CT 1141, BG 1	850	10	1.2%	827	**97.3%**	4	0.5%	1	0.1%	0	0.0%	0	0.0%	8	0.9%	14	1.6%
CT 1142, BG 1	452	4	1%	444	**98.2%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4	0.9%	0	0.0%
CT 1143, BG 1	483	6	1%	468	**96.9%**	2	0.4%	0	0.0%	0	0.0%	0	0.0%	7	1.4%	4	0.8%
CT 1144, BG 1	234	9	4%	222	**94.9%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	1.3%	0	0.0%
CT 1145, BG 1	657	12	2%	632	**96.2%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	13	2.0%	1	0.2%
CT 1146, BG 1	1,204	491	41%	651	54.1%	0	0.0%	1	0.1%	0	0.0%	8	0.7%	53	4.4%	59	4.9%
CT 1146, BG 2	853	463	54%	349	40.9%	4	0.5%	0	0.0%	0	0.0%	28	3.3%	9	1.1%	30	3.5%
CT 1147, BG 1	1,101	12	1%	1,074	**97.5%**	0	0.0%	0	0.0%	0	0.0%	6	0.5%	9	0.8%	14	1.3%
CT 1148, BG 1	639	29	5%	588	**92.0%**	1	0.2%	0	0.0%	1	0.2%	0	0.0%	20	3.1%	8	1.3%
CT 1187, BG 3	970	362	37%	584	60.2%	1	0.1%	10	1.0%	1	0.1%	3	0.3%	9	0.9%	8	0.8%
CT 1189, BG 1	586	9	2%	566	**96.6%**	1	0.2%	0	0.0%	0	0.0%	4	0.7%	6	1.0%	2	0.3%
CT 1191, BG 1	2,604	1,746	67%	423	16.2%	7	0.3%	335	12.9%	4	0.2%	33	1.3%	56	2.2%	71	2.7%
CT 1192.02, BG 2	1,240	346	28%	877	**70.7%**	0	0.0%	2	0.2%	0	0.0%	3	0.2%	12	1.0%	2	0.2%
Demographic Area Total	**14,453**	**3,669**	**25%**	**10,043**	**69.5%**	**26**	**0%**	**354**	**2%**	**6**	**0.0%**	**98**	**0.7%**	**257**	**1.8%**	**252**	**2%**

Source: HNTB; U.S. Census Bureau 2000, Summary File 1



Legend for Demographic Areas

Reference

- Opportunity Corridor Study Area
- No Population Present
- xxxxxx x — Block Group

Percent Minority Residents

- 0% - 16%
- > 16% - 34.05% (Exceeds Ohio State Average)
- > 34.05% - 61.04% (Exceeds Cuyahoga County Avg)
- > 61.04% - 100% (Exceeds City of Cleveland Avg)

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Cleveland, OH

Date: 07/19/2010

Prepared by: LLS

Note:
GIS data used to create this map are from the best sources available. Use of this map should be used only for planning purposes.
Aerial image is dated (circa 2005) and is shown only for illustrative purposes.

0 0.125 0.25 0.5 Miles

NORTH

Figure 3-9
Percent Minority Residents

3.3.6.3 Per Capita Income

In 2000, the per capita income for the demographic study area was $9,890, which was approximately $4,400 less than the per capita income for the city as a whole **(see Table 3-10).** The median household income for the demographic area was $13,965, which was more than $11,000 less than the median household income for the city for the same year. The fact that there are fewer people per household, more one-person households, and more households with individuals over the age of 65 years residing within the demographic area are likely to be contributing factors in the lower median household income for the area. Both the demographic study area and the City of Cleveland as a whole reported lower incomes than did the county, state and country for the same year.

Table 3-10: Income Characteristics (2000)

Area	Total Population	Per Capita Income	Total Number of Households	Median Household Income
Demographic Area	14,453	**$9,890**	5,089	**$13,965**
City of Cleveland	478,403	$14,291	190,638	$25,928
Cuyahoga County	1,393,978	$22,272	571,457	$39,168
Ohio	11,353,140	$21,003	4,445,773	$40,956
United States	281,421,906	$21,587	105,480,101	$41,994

Source: HNTB; U.S. Census Bureau, 2000

3.3.6.4 Poverty Status

As specified by FHWA and ODOT guidance, low-income populations were defined as individuals listed in the 2000 Census as living at or below the federally designated poverty level. In 2000, 45 percent of the demographic study area population was below the poverty level, compared to 26 percent for the city as a whole **(see Table 3-11 and Figure 3-10, page 28).** Conversely, the percentage of the county, state and country's population below the poverty level was between 11 percent and 13 percent for the same year.

Table 3-11: Poverty Status (2000)

Area	Total Population Below Poverty Level
Demographic Area	5,104
	45%
City of Cleveland	122,479
	26%
Cuyahoga County	179,372
	13%
Ohio	1,170,698
	11%
United States	33,899,812
	12%

Source: HNTB; U.S. Census Bureau, 2000

Poverty Status by Race

As identified in **Table 3-12**, in 2000, approximately 40 percent of the demographic area's African American population was below the poverty level, compared to 17 percent of the city's African American population for the same year. In comparison with the city, a smaller percentage of the demographic area's white population was below the poverty level (6.9% and 4.7%, respectively).

Table 3-12: Poverty Status by Race (2000)

Area	Total Population (for whom poverty is determined)	Race						Hispanic or Latino
		White	Black/ African American	American Indian & AK Native	Asian & Pacific Islander	Some Other Race	Two or More Races	
Demographic Area	11,430	533	4,493	10	0	25	43	75
		4.7%	39.3%	0.1%	0%	0.2%	0.4%	0.7%
City of Cleveland	466,305	32,164	79,910	447	1,715	5,406	2,837	11,110
		6.9%	17.1%	0.1%	0.4%	1.2%	0.6%	2.4%
Cuyahoga County	1,365,658	65,390	99,633	695	3,416	5,786	4,452	11,947
		4.8%	7.3%	0.1%	0.2%	0.4%	0.3%	0.9%
Ohio	11,046,987	766,827	325,857	5,678	17,022	19,640	35,674	42,104
		6.9%	2.9%	0.1%	0.2%	0.2%	0.3%	0.4%
United States	273,882,232	18,847,674	8,146,146	607,734	1,321,795	3,687,589	1,288,874	7,797,874
		6.9%	3.0%	0.2%	0.5%	1.3%	0.5%	2.8%

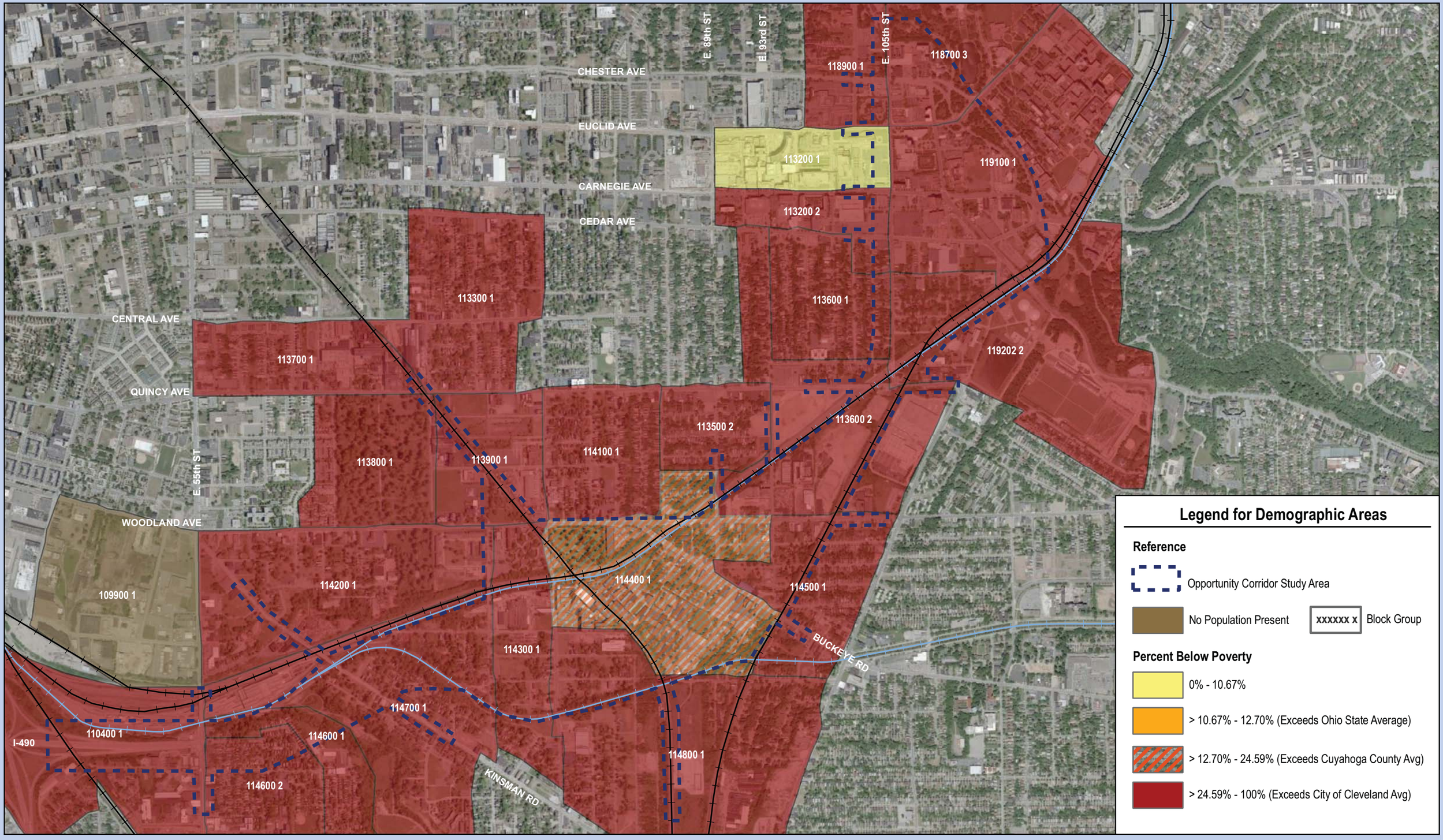
Source: HNTB; U.S. Census Bureau, 2000

Conceptual Alternatives Impact Assessment

Based on the analysis, the characteristics of the population within the demographic area and the study area indicate there are unique characteristics of the area that are quite dissimilar from either the City or County, as the demographic area represents a higher minority and low-income population. A preliminary assessment of possible impacts to environmental justice populations as a result of the conceptual build alternatives includes the following:

- Relocation of single-family housing and apartment units
- Business displacements - However, at this time, it is not specifically known which of these businesses are minority owned or employ individuals from environmental justice populations. As the project advances, further information will be obtained.
- Access - The proposed Opportunity Corridor would improve east-west mobility, as well as improve local access and connectivity between I-77/I-490 and the University Circle neighborhood; for pedestrian access, intersecting roadways which are proposed for widening will include consideration of appropriate pedestrian crossings to facilitate pedestrian movements.
- Increased traffic
- Increased noise
- Reduced air quality

There are also impacts associated with the No Build alternative. The No Build alternative would maintain the status quo in the study area. Over the last few decades, the highway network has been expanded rapidly. Consequently, trucks replaced rail as the most efficient method of transporting and distributing goods. This paradigm shift resulted in study area businesses leaving in search of locations with better access to the interstate highway system, enhanced visibility and new infrastructure to support their business needs. As the study area businesses closed or left, employment opportunities were reduced, and the neighborhoods began to decline.



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Note:
GIS data used to create this map are from the best sources available. Use of this map should be used only for planning purposes.
Aerial image is dated (circa 2005) and is shown only for illustrative purposes.

0 0.125 0.25 0.5 Miles

NORTH

Figure 3-10
Percent Below Poverty

According to information provided by the U.S. Census Bureau, population within each study area neighborhood has declined steadily since 1940 **(see Table 3-13).** The loss of jobs and population has resulted in high vacancy rates for residential and commercial properties. In addition to decreasing the property values and aesthetic appeal of the neighborhoods, the high vacancy rates increase the maintenance burden on government agencies, such as the City of Cleveland, to maintain the vacated properties. The increasing numbers of vacated properties has also created the perception of higher crime rates among study area residents. The loss of residences and businesses has diminished community cohesion. Properties of environmental concern remain from the closed industrial and commercial businesses that once existed in the study area. These properties complicate the feasibility of redevelopment in the study area. Without the investment in transportation infrastructure proposed with the Opportunity Corridor project, it is anticipated that these historic trends and potential barriers to development and redevelopment would continue in the study area neighborhoods.

Table 3-13. Population by Study Area Neighborhood

Neighborhood	1940	1970	2000	% Change (1940 - 2000)
Buckeye-Shaker	19,537	18,496	16,093	-18%
Central	62,038	27,280	12,107	-80%
University Circle	17,221	12,804	9,469	-45%
Fairfax	35,456	22,157	7,352	-79%
Kinsman	20,139	15,361	5,842	-71%
North Broadway	21,003	13,424	9,049	-57%

Source: U.S. Census Bureau

Although there are impacts associated with the proposed project, the Opportunity Corridor could also benefit minority and lower income residents who live in the area. One benefit for residents is better access to job and community opportunities. This improved access includes the ability to more conveniently travel between destinations, such as from the University Circle, to food centers, to schools, to church or community facilities, and to key recreational facilities such as the Kenneth Johnson Recreation Center. The proposed project will also improve access to the Interstate system for many residents in the study area. Additionally, access to health care facilities in the University Circle neighborhood would also be improved. This improved ability for travel with the Opportunity Corridor could be affected somewhat by the resident's circumstances if the person does not have an automobile. In this case, the Opportunity Corridor project would still provide additional access opportunities, specifically an improved east-west corridor, providing new pedestrian and bicycle pathways, improved connectivity to existing bus transit and potential new bus route access, and providing better, safer access to existing rail transit stations.

Relocations resulting from the proposed project could also benefit some residences and businesses in the study area. Relocation to more established and vibrant areas would result in increased exposure for businesses, as well as enhanced community cohesion for residents. An additional relocation benefit for some residences and businesses would be the separation created from properties of environmental concern that are either adjacent or located close.

As identified earlier, 47 percent of the occupied housing units within the demographic area had no vehicle available (2000 Census). Because autos are less likely to be available to low-income populations, it is important to ensure that an improved transportation system change will also improve access for residents to local bus and rail transit services. Therefore, as the project is advanced through subsequent planning and design phases, coordination with GCRTA on providing bus services in the proposed Opportunity Corridor will be important. These new bus services will allow improved east-west mobility for lower income and minority residents to key job and community opportunities previously. During the community meetings, one of the issues for many residents was access to recreation. As one specific example, the proposed project will provide sidewalk and multi-purpose path along the proposed boulevard. Sidewalks will also be provided on intersecting roadways. These facilities would provide enhanced pedestrian and bicycle access and connectivity to recreational areas such as the Kenneth Johnson Recreation Center, the Kingsbury Run Connector Tow Path in the Kinsman neighborhood, and the proposed Lake to Lakes trail in University Circle.

Environmental justice populations could benefit from the potential economic development and re-development opportunities. As discussed in more detail in the *Connecting Cleveland 2020 Citywide Plan* (Plan), the City of Cleveland is seeking ways to create "great neighborhoods by creating connections between people and places....linking the physical and the social in order to create a community that is viable and sustainable" (City of Cleveland, 2010). In crafting and presenting its vision, the *Plan* organizes the City around clusters of neighborhoods. This neighborhood-based structure allows the Plan to focus holistically on each City neighborhood as a building block of the larger plan. In order to consider the interaction between neighborhoods, the Plan then groups 36 Cleveland neighborhoods (also known as Statistical Planning Areas) into six "districts." The Opportunity Corridor study area encompasses portions of Districts 3, 4, and 5. Development opportunities and initiatives proposed by the Plan within these Districts/neighborhoods include the following:

<u>District 3 (includes District 4 (includes Central and North Broadway neighborhoods)</u>

- Continue support of housing developments in the City's Home Ownership Zone
- Develop new retail on vacant land at the E. 55th and Woodland intersection and undertake improvements to make the district more pedestrian friendly
- Assemble sites for commercial and business development in the vicinity of E. 55th and I-490
- Capitalize on Euclid Corridor improvements to attract additional companies
- Construct an RTA transit center at Prospect and E. 22nd near Cleveland State
- Promote investments in public art at Arbor Park, E. 55th and Woodland and the Maingate area
- Rehabilitate E. 30th, Cedar and Woodland/Kinsman and undertake streetscape improvements at the E. 55th/Woodland intersection
- Create bike routes along Community College and E. 55th
- Create a landscaped green space area at the east end of the Homeownership Zone as a buffer from railroad activity
- Revitalize old industrial sites and build key connector roads to create economic development opportunities for industry in areas such as the I-490 Triangle, Bessemer at E. 55th, the Coke Oven site and the Union/Aetna area
- Develop housing options at various price points in North Broadway using rehabilitation, conversion and new infill in areas such as the former St Michael's Hospital site, Willow School neighborhood, and the Dalton Avenue/E. 52nd neighborhood
- Develop niche retail opportunities in North Broadway that complement and benefit from activity generated by the Morgana Run trail and trailhead
- Better use the existing green space and clean-up additional land to create new green space in the Kingsbury Run valley corridor
- Make North Broadway a safer community by increased police presence with officers integrating with residents via bike and foot patrols
- Undertake improvements, such as public art and interpretive kiosks, along the route of the Ohio and Erie Canal Scenic Byway on Broadway
- Target housing programs in the St. Hyacinth neighborhood off E. 65th Street

<u>District 4 (includes Kinsman neighborhood)</u>

- Development of housing and community center on vacant land off of Kinsman between Laisy and St. Catherine
- Construct a new shopping plaza at the southwest corner of E. 93rd and Kinsman
- Construct a new mini-shopping plaza along Kinsman between E. 72nd and E. 75th
- Construct Opportunity Blvd. To open up access to the Forgotten Triangle area
- Development of vacant and underutilized land west of the Hemisphere site
- Reconstruction of the Sidaway Bridge over the Kingsbury Run Valley
- Use open space and underutilized land in the Kingsbury Run Valley for trail development

District 5 (includes Buckeye, University Circle, and Fairfax neighborhoods)

- Develop Buckeye as the premier neighborhood retail corridor through streetscape and storefront initiatives to encourage entrepreneurship and investment
- Develop a community in Buckeye that offers housing options of all types and price points
- Connect the Buckeye neighborhood to recreation resources found in Cleveland and in outlying communities via trail development linking to the Shaker Lakes, Zelman George Recreation Center and Shaker Square
- Capitalize on institutional partnerships to provide development resources both physical and social to surrounding community
- Develop an arts and cultural district along Buckeye Road to promote history & heritage, provide entertainment, and promote local artistic talent
- Work to maintain the unique retail mix that makes Larchmere and Shaker Square regional destinations
- Capitalize on the proximity of Fairfax to University Circle and Euclid Corridor, leveraging those investments;
- Leverage key institutions, such the Juvenile Intervention Center, Karamu House, and the Olivet University Hospital Medical Center, to provide economic opportunity for new and existing residents;
- Create job centers in Fairfax through strategic initiatives such as Fairfax Triangle new economy neighborhood, and the Global Cardiovascular Innovation Center;
- Reinvest in key arterial roads in Fairfax including Quincy, Carnegie, and Woodland through strategic small scale investments;
- Connect the Fairfax neighborhood to University Circle and surrounding areas of the city via opportunity corridor;
- Capitalize on the presence of religious and cultural institutions in Fairfax by integrating them with the surrounding areas via programmatic and social service means; and
- Develop alternative housing providing affordable mixed-use single- and two-family structures in appropriate locations
- Encourage institutional improvements that maintain University Circle as a center of arts and culture for the region
- Encourage the student, faculty and worker populations of the universities and institutions to live in the neighborhood by providing the necessary housing, retail, entertainment job, and technological amenities they require and create a 24 hour environment
- Reinforce University Circle as the number two economic center for the region behind downtown
- Develop neighborhood connections utilizing natural amenities such as Doan Brook and Rockefeller Park
- Undertake roadway and intersection improvements that create gateways, increase safety and improve pedestrian friendliness
- Undertake improvements to transit stations that will foster the construction of transit-oriented development projects

In general, the proposed Opportunity Corridor is consistent with the identified vision for each neighborhood. Additionally, upon review of the proposed opportunities and initiatives identified for each neighborhood, it is anticipated that the Opportunity Corridor project could serve as a catalyst for community benefits beyond the identified transportation needs addressed by the project.

3.4 Natural Environment

3.4.1 Geotechnical

During Steps 1-4 of the PDP, publicly available sources of geotechnical information were reviewed. This included information from the Ohio Department of Natural Resources (ODNR), ODOT, and USGS and the data was used to compile information documenting the geotechnical characteristics associated with the project study area. During Step 5, additional record plan information was obtained from GCRTA and Cuyahoga County. A geotechnical field investigation program is proposed for Step 6. This program will include soil borings along proposed roadway alignments and at proposed structure locations. The following summarizes the record data evaluated during Steps 1-5.

The project area is located in the Erie Lake Plain physiographic region. Soils in this region include lacustrine fine sand, silt and clay of Pleistocene age (Glacial and Surficial Geology of Cuyahoga County, Ohio, Ford J.P., ODNR Division of Geologic Survey, 1987). More specifically, the surficial materials within the project area are underlain by sand, often interbedded with silt and clay that was deposited by glacial melting in valleys left by the earlier paths of the Cuyahoga River. The bedrock underlying the project area, is the Ohio Shale of the Devonian System, comprised of the black bituminous Cleveland Shale overlying the blue-grey silty Chagrin Shale.

The existing topography, as provided by the USGS quadrangles for the project area, slopes slightly upward to the east. Elevations for the project area are approximately 670 ft. above mean sea level (ft. msl), in the western portion near E. 55th Street, and 720 ft. msl in the southeastern portion near University Circle. The railroads and Rapid Transit lines are approximately 15 to 30 ft. below ground surface (ft. bgs), in man-made valleys.

3.4.1.1 Hydrogeologic Setting

In general, the majority of the project area is characterized by the hydrogeologic setting, 7D, a buried valley (Ground Water Pollution Potential of Cuyahoga County, Ohio, Barber D.J., ODNR Division of Water, 1994). Buried valleys typically can include thick deposits of fine sand, silt and clay deposited by glacial melt water. The soils in the project region consist primarily of sand and silt loam, and, in general the depth to water ranges between 5 and 15 ft. below ground surface (bgs). This is consistent with the 2003 geotechnical investigation for the Woodland Avenue Bridge, which indicates that groundwater was encountered 14 ft. bgs and the 2000 geotechnical investigation for the Cuyahoga County Juvenile Justice Center which encountered groundwater between 9 ft. and 14.5 ft. bgs.

The eastern section is considered part of the hydrogeologic setting, 7Ae, glacial till over shale. The glacial till over shale consists primarily of unsorted deposits having interbedded lenses of gravel, sand, and loess. In this portion of the project area, the till is identified as clay loam, a low permeability material. The shale is relatively impermeable. The depth to water in this area also ranges between 5 and 15 ft. bgs. It should be noted that the groundwater table will fluctuate with seasonal variations in climate, especially during periods of heavy rainfall or snowmelt.

3.4.1.2 Characteristics of the Soils

The Cuyahoga County Soil Survey indicates that the surficial soils at the site are considered part of the urban land-Elnora complex, covered by approximately 70% man-made structures, such as buildings and roads, and approximately 20% fine loamy sand. Loamy sand generally consists of approximately equal amounts of silt and clay. Fine sand layers are often stratified throughout the loamy sand. The soil survey notes that sloughing is a construction/excavation concern in Elnora soils. Below these surficial materials it is expected to encounter sand, often interbedded with silt and clay deposited by glacial melting in valleys left by the earlier paths of the Cuyahoga River overlying bedrock. In the vicinity of the Kingsbury Run Valley to the west, soil borings performed by GCRTA indicate intermittent layers of silty sand and silty clay with the silty clay extending from a depth of 42 ft. beneath the existing track to beyond the 80 foot depth of the soil boring.

3.4.1.3 Characteristics of the Rock

According to the South Cleveland and Shaker Heights USGS quadrangle bedrock geology maps, the bedrock underlying the project area is the Ohio Shale of the Devonian System, dating from 400 to 360 million years before present. The Ohio Shale is comprised of the black bituminous Cleveland Shale overlying the blue-grey silty Chagrin Shale. Based on a review of existing well-log literature, the bedrock in the western portion of the project area is expected to be at depths of at least 20 ft. bgs, except in the Kingsbury Run Valley area where silty clay was still being encountered at boring depths of 80 ft. below a GCRTA track elevation of 634. In the eastern portion of the project, bedrock was encountered at depths of 19 ft. bgs at the Juvenile Justice Center facility.

3.4.1.4 Previous Geotechnical Reports and Investigations

Geotechnical investigation reports and record plans for bridge rehabilitations were available from the City of Cleveland and ODOT. These reports generally compare favorably with the information found in the literature search on subsurface materials.

The 1995 geotechnical investigation for the Quincy Avenue bridge rehabilitation is located near the eastern limits of the current project. Two soil borings advanced for the Quincy Avenue Bridge indicated that the subsurface conditions generally consist of sandy silt and silty clay fill material used to construct the embankment, overlying clay shale bedrock. In the natural sandy silt material, competent bedrock was encountered at 11.5 ft. bgs. In the

boring where fill was encountered, competent bedrock was encountered at 35 ft. bgs. Groundwater levels were not noted due to the fact that water from external sources was used for coring.

The 2003 geotechnical investigation for the Woodland Avenue bridge rehabilitation is located in the Central portion of the current project. Three soil borings advanced for the Woodland Avenue Bridge indicated that the subsurface conditions generally consist of fill material comprised of sandy silt or silty clay, overlying clay shale bedrock. Clay shale bedrock was encountered at depths ranging from 4 to 32 ft. bgs depending on the thickness of the fill material. Groundwater was encountered in one boring at 14 ft. bgs.

2009 Geotechnical investigation data for the E. 55th Street GCRTA transit station project at the west end of the project indicate layers of silty sand and silty clay with the silty clay extending from a depth of 42 ft. beneath the existing track to beyond the 80' depth of the soil boring.

3.4.1.5 Soil Classifications and Problem Conditions

The Cuyahoga County Soil Survey indicated that sloughing is a possible construction/excavation concern in Elnora soils. Excavation sidewall stability is also a possible concern and would likely require bracing or proper sloping. The potential of a high groundwater table may present problematic conditions for structural support using conventional foundation systems. Loose wet soils often require deep foundation elements. The presence of construction and demolition debris throughout the alignment areas may likely be unstable as a bearing surface, and require removal and backfilling with proper engineered fill or a non-traditional foundation system.

3.4.1.6 Bedrock and Problem Conditions

The overburden soils are anticipated to be underlain by the Ohio Shale bedrock of the Devonian System (Glacial Geology of Northeastern Ohio, White, George W., ODNR Division of Geological Survey, 1982). The Ohio Shale is comprised of the black bituminous Cleveland Shale overlying the blue-grey silty Chagrin Shale. Based on a review of existing well-log literature and previous geotechnical investigation reports, the bedrock in the western portion of the project area is expected to be at depths of at least 20 ft. bgs and even shallower to the east. Maximum depth to rock of approximately 32 ft. (based on previous geotechnical investigation reports) may present concerns relating to rippable shale and pile relaxation, except in the Kingsbury Run Valley area where bedrock was not encountered at depths of 80' below GCRTA track elevation.

Conceptual Alternatives Impact Assessment

In general, geologic concerns are not dependent upon alternate selection. Within the East Section, all alternates would be constructed at grade in proximity to each other and therefore would likely encounter the same subsurface conditions. Within the Central Section, the alternates share a common alignment towards the west and all require a new bridge structure under Norfolk Southern's mainline track. Geologic concerns would again be common for this area. East of Norfolk Southern the alignment locations vary by alternate but data has not been identified to indicate a variation of subsurface conditions. Alternate B would have the least likeliness to encounter geologic hazards since it only requires one new bridge structure, whereas Alternates A and C would each require the reconstruction of one additional bridge. Within the West Section, all alternates share a common alignment from the Kingsbury Run Valley to the interface with the Central Section. East of the Kingsbury Run Valley the alternates are in close proximity to each other however they will have unique vertical alignments and will require different numbers of structures. Alternate A would be constructed at grade and not require additional bridges west of the Kingsbury Run Valley. Alternate B would be constructed below grade of E. 55th Street and would require three bridges. Alternate C would again be constructed below grade of E. 55th Street but would only require one bridge structure. Due to deep bedrock elevations, it is anticipated that structures at this location could utilize cast in place piles to support the anticipated loads. This is consistent with the 1987 plans for the replacement of the E. 55th Street bridge over GCRTA and the 2009 plans for the E. 55th Street Transit Station. Geotechnical field investigations will occur during Step 6 at which time alignment specific data will be available for analysis.

3.4.2 Streams

A Level 2 Ecological Survey Report (ESR) was completed in January 2010[7]. This report is incorporated by reference. As part of that assessment, field investigations were conducted in October 2009 to identify jurisdictional streams and surface water bodies in the study area. Based on the results of the field assessment, there are no jurisdictional streams and no surface water bodies within the study area. Three ditches were identified on the Greater Cleveland Regional Transit Authority (RTA) property. These ditches were located immediately adjacent to the rail balloon loop located south of the RTA line and between E. 55th Street and Kinsman Road. The ditches are seasonal and contain no aquatic life or habitat. All three identified ditches drain to Kingsbury Run via existing storm sewer pipes. Kingsbury Run is a captured underground stream and provides no habitat or functional use for aquatic life. The ODOT Ecological Section reviewed these ditches and determined that they would not be considered jurisdictional, as they do not have an ordinary high water mark (OHWM) and are not constructed in hydric soils.

Conceptual Alternatives Impact Assessment

The proposed project will not impact any streams or ponds/lakes/reservoirs. ODOT reviewed the Level 2 ESR and concluded that no further ecological coordination is required for the proposed project.

3.4.3 Wetlands

Field investigations completed during the development of the Level 2 ESR revealed no wetlands within the study area.

Conceptual Alternatives Impact Assessment

The proposed project will not impact any wetlands. ODOT reviewed the Level 2 ESR and concluded that no further ecological coordination is required for the proposed project.

3.4.4 Threatened or Endangered Species

The Level 2 ESR indicates that no federally listed species were observed within the study area. Additionally, no suitable habitat or designated critical habitat for federally listed species was observed within the study area. Coordination with U.S. Fish and Wildlife Service (USFWS) has determined that the proposed project would have no effect on Threatened and Endangered Species. A copy of the coordination letter from USFWS is included in **Appendix C**.

No state listed species were observed within the study area or within one-mile of the study area. No suitable habitat for State listed species was found within the study area.

Conceptual Alternatives Impact Assessment

No impacts to either federally listed or State listed species are anticipated as a result of the proposed project. ODOT reviewed the Level 2 ESR and concluded that no further ecological coordination is required for the proposed project.

3.5 Stormwater Management

The Opportunity Corridor study area is highly urbanized and has no extended reaches of natural channels present within or near the proposed project alignments. Generally, the western and central portions of the study area drain to the west, while the eastern portion drains to the north. The existing surface water drainage system discharges to a portion of the combined sewer overflow (CSO) system maintained in part by the Northeast Ohio Regional Sewer District (NEORSD) and in part by the City of Cleveland Water Pollution Control (Cleveland WPC). Cleveland WPC maintains the smaller local lines that feed the larger interceptor sewers maintained by NEORSD. The local lines were designed to convey a two to three year storm event. NEORSD also maintains the flow regulators within the system. During dry weather and low flow conditions, sanitary waste, industrial waste and storm water runoff (combined sewage) is all conveyed to the wastewater treatment plants. During storm events, the flow regulators allow some of the untreated combined sewage flow to be diverted, receive no treatment and flow into waterways or Lake Erie. The points of discharge are known as combined sewer outfalls (CSOs). There are six CSOs that have a portion of their drainage area within the project study area. These outfalls discharge to the Cuyahoga River to the west, Lake Erie to the north and Doan Brook to the east.

The City of Cleveland's Storm Water Management Plan (SWMP) encourages the use of non-structural best management practices (BMPs) and low-impact development techniques. The SWMP requires redeveloped properties to control stormwater quantity through the use of detention facilities. The SWMP indicates that the City is exploring options to add water quality measures to the detention requirements. ODOT has developed various stormwater best management practices that can be used to treat both water quantity and quality. These could include constructed wetlands, extended detention or retention basins. Conceptual locations for these facilities, as well as a detailed narrative for the stormwater management assessment completed for Step 5 is included in **Appendix E. Table 3-14 page 32** contains a list of project stormwater discharge options and the associated design concerns for each option.

[7] Michael Baker Jr., Inc. *Ecological Survey Report for Opportunity Corridor (PID 77333)*. January 5, 2010.

Table 3-14: Design Concerns for Each Potential Discharge Option

Project Stormwater Discharge Options	WWTP Capacity a Concern ?	System Capacity Analysis and Quantity BMPs Required?	ODOT Water Quality BMPs Needed?	Cleveland SWMP Jurisdiction ?	Capacity of Existing Local System a Concern?	Potential for Increased Combined Overflow?
Discharge to local combined system	Yes	Yes	No	No	Yes	Yes
Discharge to NEORSD Interceptors	Yes	Yes	No	No	No	Yes
Discharge upstream of regulators on NEORSD CSO outfall line	Yes	Yes	No	No	No	Yes
Discharge downstream of last regulator on NEORSD CSO outfall line	No	Yes	Yes	No	No	No
Discharge directly to new project storm water only outfall	No	No	Yes	Yes	No	No

Conceptual Alternatives Impact Assessment

There is no documented or published design standard for facilities contained with the NEORSD service area; however, the following sections describe the process involved in connecting project storm water runoff to the NEORSD system:

- Permission to tie into a district line is all dependent upon the capacity available or built into the line in question – every potential sewer tap is done on a case-by-case basis. NEORSD engineering is responsible for approving the design and supporting capacity analysis.
- CSO Control Program design criteria summary – Typical design year storm events are derived from Cleveland Hopkins International Airport rainfall data (46 years worth of data collected). The NEORSD evaluates this data and documents the fifth highest storm (5th largest storm would be less than the 5-year/1-hour storm. This storm is related to a 6 month +/- storm) and this storm is then used as the basis for design. Should the project design be advanced in the ODOT PDP process, there will be a detailed hydraulic model developed to assess system operation. The assessment is used to determine how the tunnels operate. This would include determining where and when the tunnels are "closed off" from further rainfall or surface runoff input which would then lead to subsequent surface water discharges. Storm surges within tunnels causing overflow events are design issues which are addressed during the hydraulic modeling of specific systems. The majority of the consolidation (local collection pipes) pipes which convey flow to the tunnels are typically designed and sized for the 5-year storm peak discharge.

This creates the following two design scenarios for the Opportunity Corridor:

- For runoff or drainage that will continue to be discharged into the combined system, ODOT will be required to work with NEORSD to model these project drainage areas and evaluate the current and proposed runoff volumes being discharged into the system. In these project areas, the governing design method will be design criteria approved by NEORSD. An evaluation of the existing and proposed project's peak discharges in areas where additional pavement will be constructed will be completed by the planning and design team. This evaluation will then be submitted to the NEORSD for a determination of the impact of these proposed changes upon the capacity of the NEORSD combined sewer system. ODOT will then review the NEORSD impact study for concurrence.
- For project areas where ODOT is separating runoff from NEORSD CSO drainage areas, ODOT's drainage design methods and criteria will govern.

The following factors will be evaluated to assist in determining BMP selection and documenting whether project stormwater runoff can be separated from the surrounding NEORSD combined sewer system:

- Availability of right-of-way area for BMP use.
- Ability to divert project runoff to local storm sewer conveyance system.
- Ability to locate, purchase easements and construct necessary storm sewer conveyances to a reasonable outfall location.
- Impacts on local road systems as a result of the proposed Opportunity Corridor project work.
- Ability to construct and install post-construction stormwater runoff controls in drainage areas determined to be separated from the combined sewer system.
- Ability to provide a potential positive impact on the combined sewer overflows and system capacity issues with the existing combined sewer systems.
- Ability of stormwater separation to complement NEORSD Long Term Control Plans, completed studies, Early Action Plans, or NEORSD NPDES permit(s) for CSO outfalls
- Need to address or incorporate Cuyahoga River Total Maximum Daily Load requirements into BMP recommendations
- Need to consider City of Cleveland's municipal separate stormwater sewer system (MS4) SWMP BMPs.
- Ability to access recommended post-construction BMPs for operation and maintenance services
- Ability to use any right-of-way purchased for the proposed project to construct post-construction controls.

Additional coordination with Cleveland WPC and NEORSD will be required as the project advances through the project development process. Due to the lack of surface water outlets within or near the project study area, it is likely that the proposed storm water system would need to tie into either the local combined sewer or an interceptor sewer. This would likely require water quantity detention to control the amount of flow from the increased impervious area created by the proposed roadway. Constructed wetlands, extended detention or retention basins could be utilized for water quantity detention for a new storm water only system. Water quality treatment would not be required for flows that are conveyed to the wastewater treatment plant. Existing combined sewers that are required to remain in service and are impacted by the proposed roadway would need to be reconfigured to maintain flow or new sanitary sewers would need to be constructed to serve existing and proposed development.

Based on analysis performed to date, alternative selection does not appear to be dependent upon stormwater management considerations – meaning that concepts developed to address the management of stormwater would apply to any of the alternatives under consideration. A more detailed analysis should be performed upon further coordination with regulatory agencies if feasible alternatives are developed. It is noted that the underpass alternates at E. 55th Street (West Section Alternates B & C) would likely impact the existing local and interceptor systems located below the intersection and in the St. Hyacinth neighborhood. Based on data obtained from NEORSD, it appears that the combined sewer, interceptor and regulator, if impacted, could be relocated in a southerly direction beyond the southern bridge limit.

3.6 Cultural Resources

In late 2009, a Phase I History/Architecture Survey was prepared for the study area[8]. This report is incorporated by reference. The report is currently being coordinated with the Ohio State Historic Preservation Office (OSHPO).

The Phase I History/Architecture Survey identified the following resources within the Area of Potential Effects (APE) that were either listed on the National Register of Historic Places (NRHP) or determined eligible for the NRHP:

- Woodland Cemetery (86001253) – Located north of Woodland Avenue and west of 71st Street
- St. Elizabeth's Magyar Roman Catholic Church – Located on the south side of Buckeye Road east of E. 90th Street
- Kenneth Johnson Recreation Center (formerly the Woodland Recreation Center; Resource CUY-00940-10) – Located in the southwest quadrant of E. 93rd Street and Woodland Avenue

[8] Michael Baker Jr., Inc. *Phase I History/Architecture Survey Report for the Opportunity Corridor Project (PID 77333)*. January 2010.

- Cleveland Club/Tudor Arms (08000113) – Located in the southwest quadrant of E. 107th Street and Carnegie Avenue intersection
- Kossuth Monument (Resource 06130-05) – located on south side of Euclid Avenue and east of Chester Avenue/Stearns Road
- Hanna Monument (Resource CUY-06129-05) – located on north side of Euclid Avenue and east of Chester Avenue/Stearns Road
- Wade Park Historic District (82001372) – southern boundary follows Chester Avenue, Martin Luther King Drive and Euclid Avenue
- Pentecostal Church of Christ (Resource CUY-00366-05) – Located within the Wade Park Historic District in the northeast quadrant of the Chester Avenue/E. 105th Street intersection
- Epworth Euclid Methodist Church (Resource CUY-00283-05) – Located within the Wade Park Historic District in the northeast quadrant of the Chester Avenue/Stokes Boulevard intersection. This facility is also referred to as University Circle United Methodist Church.
- Park Lane Villa (Resource CUY-00369-05) – Located within the Wade Park Historic District in the southeast quadrant of the Park Lane/E. 105th Street intersection
- Wade Park Manor (Resource CUY-00292-05) – Located within the Wade Park Historic District in the southwest quadrant of the Park Lane/Stokes Boulevard intersection
- The Temple – Located within the Wade Park Historic District on the west side of 105th Street and north of Park Lane

The Survey recommended that the two associated buildings (CUY-00954-10 and CUY-00955-10) of the St. Elizabeth's Magyar Roman Catholic Church be re-assessed to determine if they should be included in the National Register boundaries as contributing elements.

The following seven resources within the APE were recommended for further study as part of a Phase II History/Architecture Survey to determine NRHP eligibility:

- Ohio Bell/AT&T Building (Resource OC-451) – Art Deco Commercial Building located in the southwest quadrant of Wilbur Avenue/Stokes Boulevard intersection
- Segelin's Florist Building (Resource OC-453) – Art Deco Commercial Building located in the northwest quadrant of Carnegie Avenue/E. 105th intersection
- Cleveland School of Arts Elementary School (Resource OC-464) – Neo-Classical Revival School building located at 2501 E. 61st Street
- John Hay Campus High School (Resource CUY-00393-05) – Neo-Classical Revival School building located at 2075 Stokes Boulevard
- Parkside Dwellings (Resource CUY-00713-05) – Triangular shaped, Vernacular apartment building located in the southeast quadrant of the Stearns Road/E. 109th Street intersection
- Bridge structure SFN 1894609 – Carries the RTA Green/Blue Line over Holton Avenue and Norfolk Southern Railroad
- Bridge structure SFN 1894633 – Carries RTA Green/Blue Line over E. 92nd Street.

Figure 3-11, Appendix A shows the locations of surveyed resources within the APE.

Conceptual Alternatives Impact Assessment

The Phase I History/Architecture Report is being coordinated with OSHPO. Additional coordination will be required to determine the potential for any historic districts within the APE. Additionally, several Phase II History/Architecture Surveys were recommended to determine NHRP eligibility status for several resources found within the APE. Consequently, a complete assessment of effects to historic architectural resources cannot be completed at this time. However, for the purposes of the report, a preliminary assessment of direct impacts is included below and summarized in **Tables 3-16** and **3-17,** which can be found in the Section 4(f) discussion of this report. ODOT will coordinate with the SHPO to ensure that the proposed modifications do not have an adverse effect, as defined in Section 106 of the National Historic Preservation Act of 1966, on the identified resources within the APE. ODOT, on behalf of the FHWA, formally initiated Section 106 consultation with the OSHPO on May 29, 2010 to ensure identification and consultation efforts are commensurate with the undertaking and type of cultural resources located in the study corridor. A copy of the correspondence with OSHPO is included in **Appendix C**.

The West Section conceptual alternates are not anticipated to impact any historic resources.

The conceptual alternates under consideration for the Central Section would impact St. Elizabeth's Magyar Roman Catholic Church (Central Alternates B and C) and the Kenneth Johnson Recreation Center which was formerly known as the Woodland Recreation Center (Central Alternates A and B).

Conceptual alternates for the East Section would impact Cleveland Club (Tudor Arms), the Wade Park Historic District, the Pentecostal Church of Christ, Park Lane Villa, and the Temple.

3.7 Archaeology

A Phase I literature review, prehistoric context, and archaeological sensitivity assessment (Phase I archaeology report) was completed for the proposed Opportunity Corridor project in February 2010[9]. This portion of the cultural resources investigation was undertaken to comply with Section 106 of the National Historic Preserved Act of 1966, as amended. The report is being coordinated with ODOT and OSHPO.

The goals of the archaeological investigation were to collect data regarding previously identified cultural resources within the archaeological study area (ASA) and previous archaeological investigations in the vicinity, to develop a prehistoric context and environmental setting for the ASA, and to evaluate the potential for significant archaeological resources to exist within select portions of the ASA. The ASA is defined as the study area and, for the purposes of this assessment; it was divided into 11 sub-areas. A figure showing the ASA and the 11 sub-areas can be found in **Figure 3-12, page 34.** The majority of the ASA was found to have a low potential to contain significant archaeological resources. Three of the 11 sub-areas, were determined to have a low to moderate potential to contain significant archaeological resources based on the potential resource type and their associated historic context.

Conceptual Alternatives Impact Assessment

Ultimately, the information contained in the Phase I archaeology report indicates that the probability of encountering a significant, previously undocumented archaeological resource within the ASA is not very high. However, the report does not contain sufficient information to allow for differentiation between the conceptual alternatives and their potential impacts to identified archaeological resources.

Given the conceptual nature of the alternatives, the review of potential archaeological significance was necessarily broad and additional research will need to be conducted once an alternative has been selected. This research can be focused to individual blocks, streets, and even properties to evaluate preservation potential and potential significance in much greater detail than is currently possible. The investigation completed indicates that additional archaeological investigation in areas that possess a low probability for containing significant archaeological resources are probably not warranted. The report recommends that it may be most effective to concentrate future investigations on those areas with the greatest potential to contain significant resources. The focal areas identified by the report include Areas 4, 7, and 8, and the vicinity of the Doan's Corners cemetery in Area 11.

ODOT will coordinate with the SHPO to ensure that the proposed modifications do not have an adverse effect, as defined in Section 106 of the National Historic Preservation Act of 1966, on the identified resources. ODOT, on behalf of the FHWA, formally initiated Section 106 consultation with the OSHPO on May 29, 2010 to ensure identification and consultation efforts are commensurate with the undertaking and type of cultural resources located in the study corridor. A copy of the correspondence with OSHPO is included in **Appendix C**.

[9] ASC Group, Inc. *Phase I Archaeological Literature Review, Prehistoric Context, and Archaeological Sensitivity Assessment for the Opportunity Corridor Project (PID 77333).* February 2, 2010.

Archaeological Study Area (ASA)
Area boundary
Base: Aerial photograph 2007

Chester Avenue
Euclid Avenue
Carnegie Avenue
Cedar Avenue
Quincy Avenue
Woodland Avenue
Holton Avenue
Colfax Road
Kinsman Road
Shaker Boulevard
Buckeye Road
Martin Luther King Blvd.
East 103rd Street
East 105th Street
E 107th St./ Stokes Blvd.
East 88th Street
East 93rd Street
East 55th Street
East 75th Street
Woodhill Road
Cedar Glen Parkway
Conrail
RTA Commuter Rail
I-77
I-490

AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
AREA 6
AREA 7
AREA 8
AREA 9
AREA 10
AREA 11

N
0 210 420 840
METERS
0 700 1400 2800
FEET

Figure 3-12
Opportunity Corridor
Archaeology Study Area

3.8 Hazardous Materials

An Environmental Site Assessment Screening Report (ESAS) was completed for the proposed Opportunity Corridor project in November 2009 [10]. This report was approved by ODOT and is incorporated by reference. The purpose of the ESAS was to identify all parcels within the project area and develop a list of suspect properties or conditions that pose a potential environmental concern and would require a Phase I Environmental Site Assessment (ESA).

The project area encompassed a total of 1,905 parcels consisting of residential, commercial, industrial and recreational uses. A total of 445 properties were identified in the project area and evaluated as part of the ESAS. Based on a review of mapping resources, regulatory databases, and the visual site inspection activities, 198 properties were recommended for Phase I Environmental Site Assessment (ESA) activities. Seven additional properties adjacent to the project area were also identified as suspect properties and recommended for further investigation as part of the Phase I ESA activities.

Conceptual Alternatives Impact Assessment

Each of the conceptual alternatives for the proposed Opportunity Corridor would require right-of-way acquisition from properties recommended for further Phase I ESA activities. A summary of these impacts for each conceptual alternative is shown below in **Table 3-15** and illustrated in **Figure 3-13, Appendix A**.

Table 3-15: Impacts to Properties Recommended for Phase I ESA Activities – All Sections

Section	Potential Impacts		
	Alternate A	Alternate B	Alternate C
West	26	25	26
Central	60	52	50
East	26	28	23

3.9 Context Sensitive Solutions

The environment along and around which a new transportation facility is planned is referred to as the project's context. Context Sensitive Solutions (CSS) simultaneously advance the objectives of safety and mobility with preservation and enhancement of aesthetic, historic, environmental, and community values. The Opportunity Corridor project is following the ODOT process for CSS. This is an integrated process that includes informed understanding involving a multi-disciplinary team of design professionals where the public has early, often, and continuous involvement on all issues related to the project.

Currently, the study area transitions between established neighborhoods, industrial areas and major employment centers. The neighborhoods within the study area each have a unique character but are lacking physical connection.

Conceptual Alternatives Impact Assessment

During the public involvement process, neighborhood, and business coordination meetings, stakeholders were asked to identify elements they would like to see preserved and/or improved in the study area as the planning process moves forward. According to stakeholder comments, the following improvements were deemed most important:

- Beautification and rebuilding of the neighborhood
- Improved streets and streetlights
- Rebuilding or eliminating vacant lots and abandoned buildings
- New small businesses, retail, and shops
- Enhanced access to public transit
- Increased employment opportunities
- Design should support change and economic development

To the greatest degree possible, these suggestions were incorporated into the plans for each of the conceptual alternatives. All of the alternatives include the following context sensitive elements:

- Addition of sidewalk and multi-purpose path along proposed boulevard and intersecting roadways
- Improved access to recreational amenities such as Kenneth Johnson Recreation Center, the Kingsbury Run Connector Tow Path in the Kinsman neighborhood, and the proposed Lake to Lakes trail in University Circle
- Potential for local jobs through creation of re-development opportunities associated with improved freeway/local access
- Removal of abandoned structures within the proposed right-of-way
- Opportunity for enhanced neighborhood identity through gateways, wayfinding and public art
- Aesthetic enhancements
- Enhanced security through street lighting, as well as traffic- and pedestrian-generated human presence

3.10 Transportation

3.10.1 Pedestrian and Bicycle Facilities

In June 2002, the City of Cleveland announced the "Bicycle Friendly Cleveland Initiative". The major goals of the initiative include: increase bike ridership; connect neighborhoods to the lakefront and Cuyahoga Valley; link parks and open space; create a 180-mile network of shared roadways, bike lanes and all purpose trails; build a better transportation system; increase awareness of bicycle safety; improve the health of Clevelanders; and improve air quality and the environment. One way to achieve these goals is through the City of Cleveland Master Bikeway Plan adopted in June 2003, which details existing and planned bikeways. See **Figure 3-14, page 36**. Other initiatives include the Mayor's Bicycle and Pedestrian Advisory Committee, the adoption of bike design guidelines by the Cleveland City Planning Commission, adoption of national "best practices for roadway and trail design," the city racks/city seats project and GCRTA's bike racks on buses.

A plan produced by NOACA entitled *NOACA Regional Bicycle Plan (July 2004)* (9) promotes bike ridership in Cuyahoga County and the surrounding counties. NOACA serves as the Metropolitan Planning Organization (MPO) with responsibility for comprehensive, cooperative and continuous planning for highways, public transit and bikeways. The plan has the following goals:

- Create a regional network of safe bikeways and supporting bicycle facilities
- Increase bicycle planning and provision of facilities at the local level
- Increase bicycle ridership in the region
- Promote safer bicycling in the region
- Encourage involvement of the private sector and other support for bicycling for transportation and recreation.

The report finds that since 1997, the number of planned and proposed bikeways in the region has rapidly increased.

Within or near the study area, there is an existing bikeway paralleling the Cuyahoga River connecting to a dedicated bikeway that runs along the lakefront. In addition, there is a bicycle circulation system on the Case Western Reserve University campus along the Martin Luther King Jr. Drive corridor. Plans to expand the bicycle links for local and regional circulation on the campus are under consideration. The recently constructed Euclid Corridor Transportation Project also includes on street bike lanes.

The Kingsbury Run Greenway Project is a proposed connector trail between the Cuyahoga River Towpath and E. 79th Street. This improvement would benefit the North Broadway and Kinsman neighborhoods. The Towpath Trail was constructed 175 years ago as a simple dirt path on which to lead animals pulling canal boats along the Ohio & Erie Canal. In 1974, the National Park Service established the Cuyahoga Valley National Park and converted approximately 20 miles of the towpath into a shared use trail. Since this time, there has been strong public interest to improve an additional 100 miles of the main trail. In addition, Cleveland Metroparks has completed approximately six miles of an additional segment of the Towpath Trail in its Ohio & Erie Canal Reservation, situated immediately north of the Cuyahoga Valley National Park. Additionally, there are recommendations for connectors to all Cleveland neighborhoods on the east and west sides of the Cuyahoga River Valley, the communities of Newburgh Heights and Cuyahoga Heights, downtown Cleveland and the Lakefront.

[10] HzW Environmental Consultants, LLC. *Environmental Site Assessment Screening – Opportunity Corridor Project Area, Cleveland, Cuyahoga County, Ohio.* November 2009.

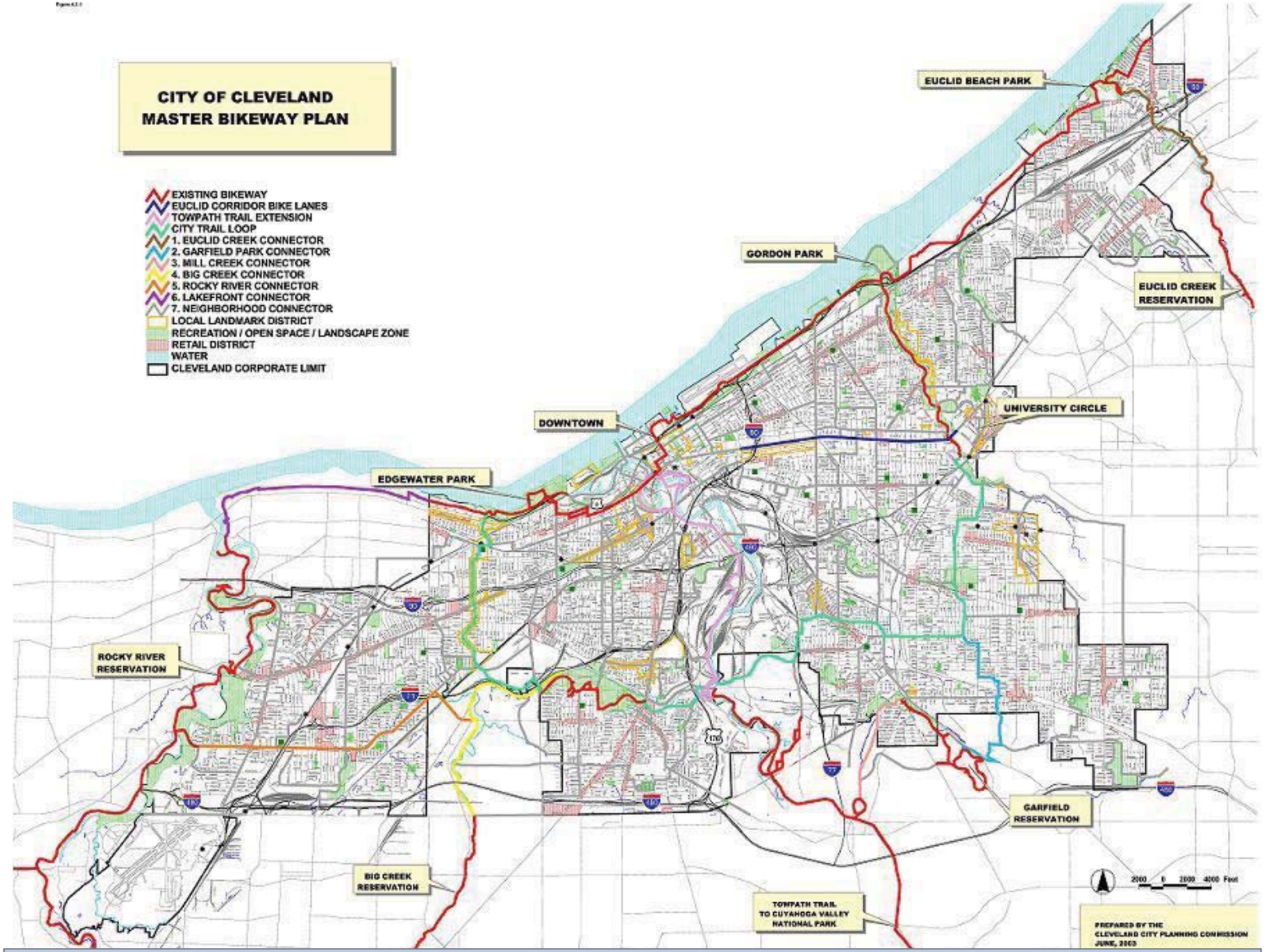


Figure 3-14
City of Cleveland Master Bikeway Plan

Conceptual Alternatives Impacts Assessment

It is anticipated that the proposed Opportunity Corridor project would have an overall positive benefit on pedestrian and bicycle travel. The typical section of the roadway as proposed includes a multipurpose path, separated from the roadway along the southern right-of-way and a sidewalk along the northern right-of-way. The typical section also includes 14' outside curb lanes to facilitate not only bus and truck traffic, but also to accommodate commuting cyclists sharing the roadway. These accommodations, in combination with access improvements created by the new roadway, improve bicycle and pedestrian connections between the neighborhoods within the study area and also connect to other existing and planned bicycle and pedestrian facilities in the region. The improved connections are listed below:

- New access across the Kingsbury Run Valley providing a replacement to the abandoned Sidaway Pedestrian Bridge
- Improved access from the east to the proposed Kingsbury Run Greenway Project and other multipurpose facilities located in Slavic Village
- Improved access from the east and west to the Kenneth Johnson Recreation Center which has expansion plans proposing to convert it to a regional recreation center
- Improved connections to the recently constructed Euclid Corridor bike lanes
- Improved connections to the Harrison-Dillard multipurpose path that connects to the proposed Lake to Lakes bikeway connecting Lake Erie to Shaker Lakes in the City of Shaker Heights
- Improved multimodal connectivity between the Slavic Village–Central–Buckeye-Fairfax–University neighborhoods providing improved access to healthcare, employment, recreational and cultural destinations
- Improved multimodal connectivity to existing and potential GCRTA services throughout the study area

Residents within the study area wishing to walk to/from local businesses may need to cross intersecting roadways, such as Kinsman Road or Woodland Avenue, which are proposed for widening and/or are projected to have increased traffic volumes on them as a result of the proposed project. The design of the Opportunity Corridor project will include consideration of appropriate pedestrian crossings and intersection improvements to facilitate these pedestrian movements.

3.10.2 Public Transportation

The Greater Cleveland Regional Transit Authority (RTA) provides public transportation services in the study area. This service includes local bus service, community circulator routes, bus rapid transit service on Euclid Avenue (HealthLine), and rail transit service on the Red, Blue, and Green lines. The RTA Red Line, which generally defines the northern boundary of the study area, operates in shared trench with the NS Nickel Plate line. The RTA Blue/Green rapid transit line is generally elevated and defines much of the southern boundary of the study area. RTA operates with 15-minute headways between trains throughout much of the day.

The following rapid transit stations exist within the study area:

- E. 55th Street Station (includes RTA electric substation)
- E. 79th Street Station (Red Line)
- E. 79th Street Station (Blue/Green Line)
- E. 105th Street/Quincy Avenue Station

RTA also owns and operates an electric substation and the central train maintenance facility near E. 55th Street within the study area and the RTA Central Bus Facility, located at 2440 Woodhill Road, just outside the study area.

Conceptual Alternatives Impact Assessment

In general, it is anticipated that the proposed Opportunity Corridor project would have an overall positive benefit on pedestrian and bicycle facility connectivity to RTA transit stations through construction of sidewalks and bicycle lanes on the proposed boulevard facility, as well as the intersecting roadway approaches.

Although some impacts to existing RTA transit facilities are anticipated with each of the West Section alternates, the proposed Opportunity Corridor project would not permanently restrict local access to RTA transit services. Each of the West Section conceptual alternates would require at least some modification of the E. 55th Street Rapid Transit Station or its appurtenant facilities. West Alternates A and C would require reconstruction of the E. 55th Street transit station parking lot and installation of a new signalized access to the parking facility. West Alternate C could also result in longer pedestrian routing to the RTA transit station. West Alternate B would have the greatest impact to RTA in that it would require reconstruction of the RTA electric substation, as well as a structure to accommodate bus movement and parking at the station site. All of the West alternates would also require a bridge structure over the RTA train loop in the Kingsbury Run Valley. Temporary impacts could be created during bridge construction. In addition, all of the West alternates would require revised drive access from Grand Avenue to the train maintenance facility. **Figure 3-15, page 38** includes concepts developed for the redesign of E. 55th Street transit station.

It is anticipated that Central Alternate A would result in temporary restrictions to the RTA Red Line due to proposed widening of the Buckeye Road bridge and demolition of the Woodland Avenue bridge. Additionally, **Section 3.10.3** describes the potential to construct a cul-de-sac on Quincy Road east of the CSX mainline. Should this occur, it would be necessary to reroute the RTA No. 10 and No. 11 bus lines.

It is anticipated that each of the East Section conceptual alternates would result in temporary restrictions to the RTA Red Line due to proposed widening of the E. 105th Street bridge structure.

3.10.3 Freight Rail

There are three freight rail facilities located within the study area. These include:

- Norfolk Southern (NS) Nickel Plate line located in the shared trench with the RTA Red Line which generally defines the north side of the study area. Nickel Plate line serves about 20-22 trains per day traveling at speeds of approximately 40 mph through the study area.
- NS mainline (Cleveland Line) which is elevated and bisects the study area in a NW to SE direction. The NS mainline serves approximately 75-80 trains per day at 40 mph speed.
- CSX mainline which is elevated and defines the east boundary of the study area. The CSX mainline serves approximately 85-90 trains per day at 40 mph speed.

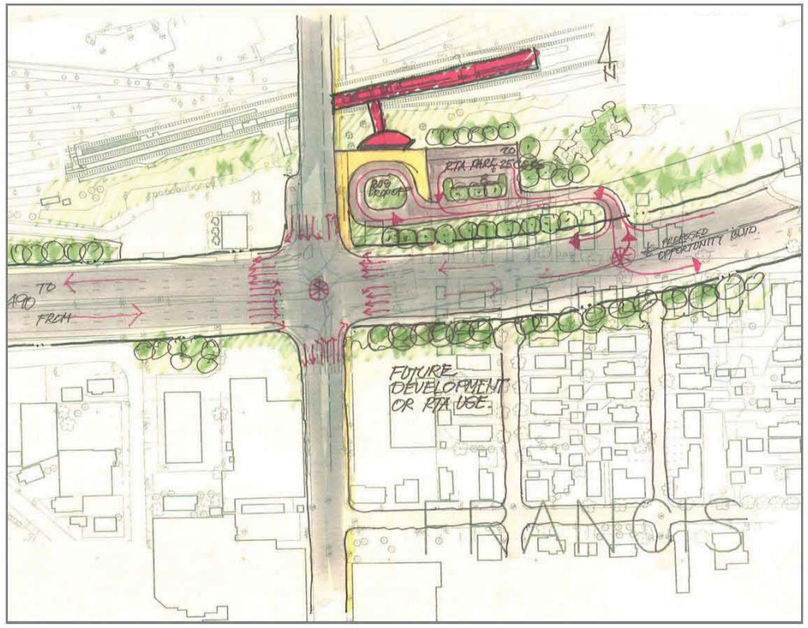
Conceptual Alternatives Impact Assessment

No freight impacts are anticipated with the West Section alternates.

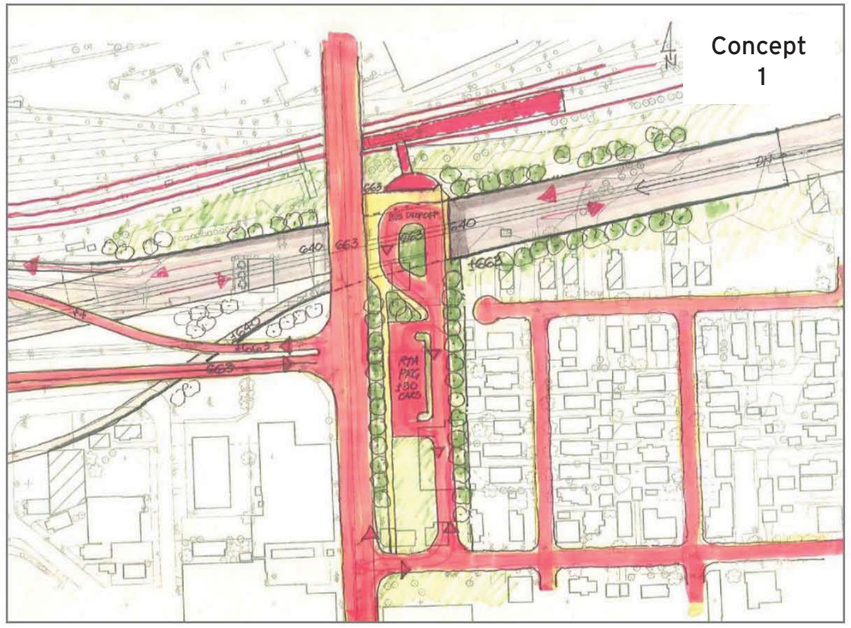
In the Central Section, all alternates would require a new rail structure to allow the proposed boulevard to pass under the NS mainline track. This new rail structure would be located on the NS mainline alignment between the existing NS Nickelplate/RTA Red line structure and the existing RTA Blue/Green line overpass structure. The proposed structure would maintain the existing rail profile. Two mainline tracks are present throughout the rail corridor. A rail runaround would facilitate construction; however, it would create additional impacts. If a runaround track is utilized, 500' on each side of the bridge would be required for crossover construction (3 degree curve for 40 mph) to be placed on the east side of the existing mainline track. This would be possible for Central Alternates B & C, but not for Alternate A, which is located within the 500' tangent distance. A runaround would impact up to four high voltage electric transmission towers. If a runaround is not utilized, then the bridge could be constructed by single tracking rail operations through the immediate project area or through the use of short term (approximately 12 hour) track outages to facilitate jump span, sheeting and top down construction. Other freight rail impacts specific to the Central Section alternates are as follows:

- Central Alternate A would require the widening of the Buckeye Road and demolition of the Woodland Avenue bridges over the NS Nickelplate trench. This work would be performed using conventional construction techniques and containment structures would be required to maintain rail traffic during construction. Local construction access appears to be available and was utilized on recent bridge construction projects in the area.
- Central Alternate B would require the demolition of the E. 89th Street bridge over the NS Nickelplate trench. This work would be performed using conventional construction techniques and containment structures would be required to maintain rail traffic during construction. Local construction access appears to be available and was utilized on recent bridge construction projects in the area.

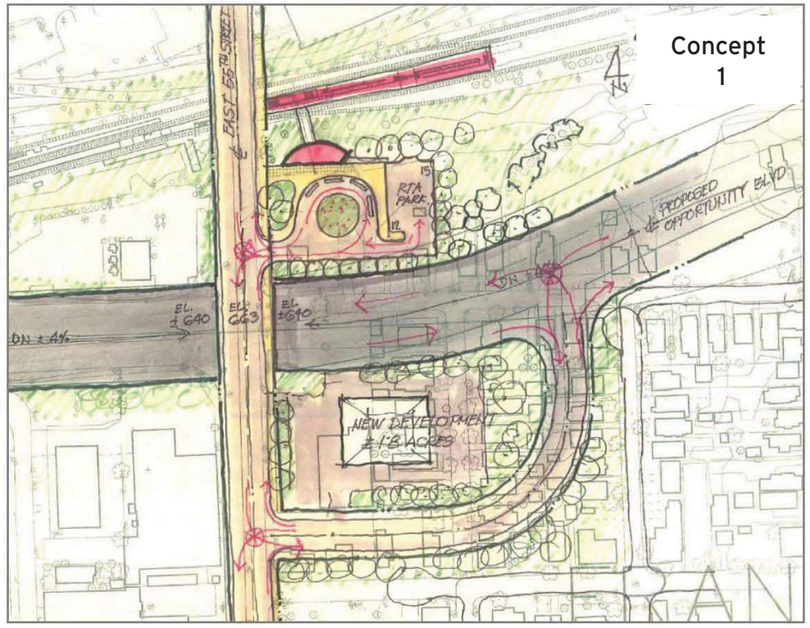
West Alternate A

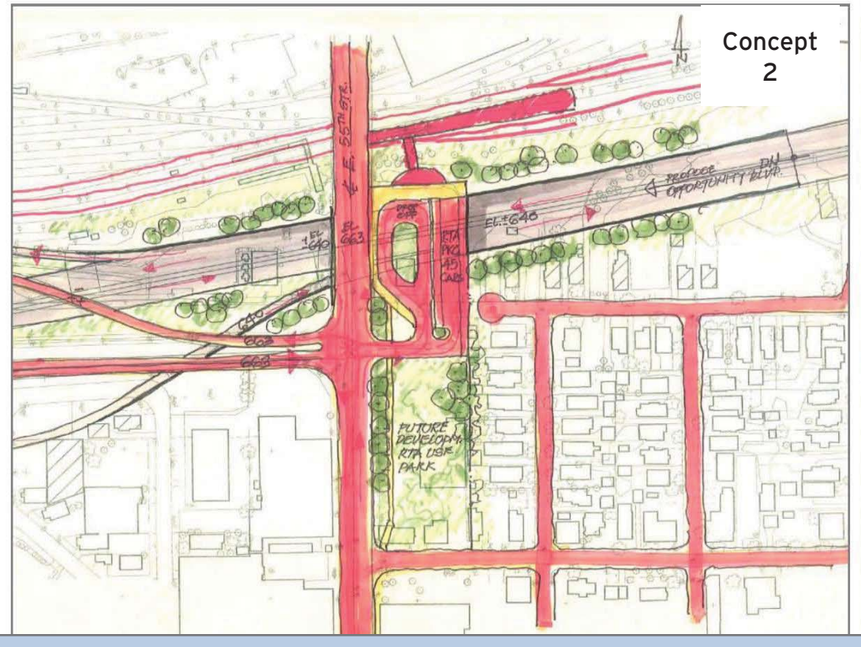


West Alternate B



West Alternate C





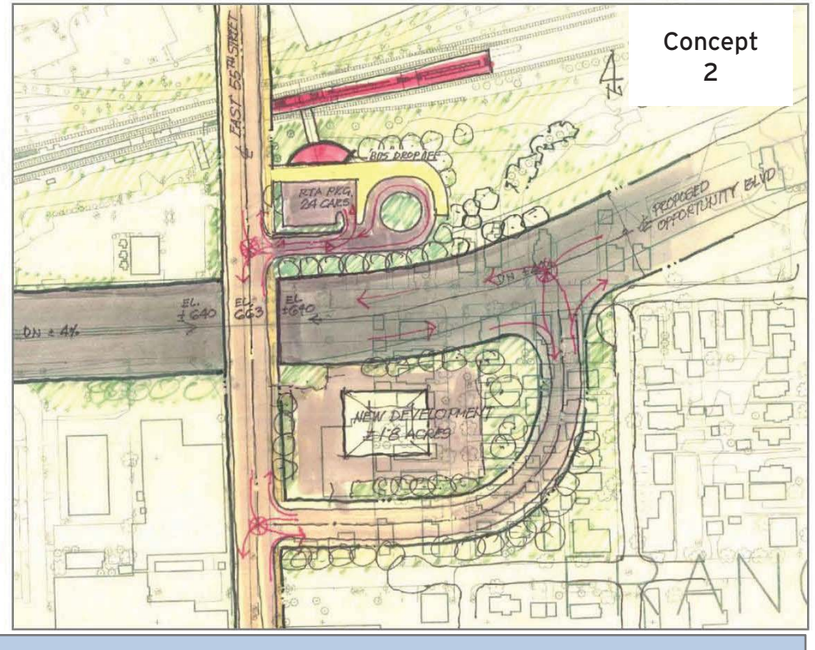


Figure 3-15
E. 55th Street RTA Transit Station Concepts

- Central Alternate C would require the abandonment of the CSX bridge over Kennedy Avenue as well as the reconstruction of the CSX bridge over Woodland Avenue to accommodate the widening of Woodland Avenue. Abandonment of the Kennedy Avenue structure would create enough tangent track alignment to facilitate construction of a rail runaround. The runaround, if utilized, would be constructed west of the existing alignment. Single tracking or top down construction should also be further considered if this alternative is recommended for further study. Based on Step 5 traffic analysis a widening of Buckeye Road is required to accommodate the addition of turn lanes onto the proposed boulevard. Traffic analysis indicates that the length of the westbound left turn lane would require replacement of the CSX bridge over Buckeye Road. The proximity of this structure could also require the replacement or abandonment of the CSX structures over Steinway Avenue and Yeakel Avenue. At this time, the replacement of the CSX structure over Buckeye Road has not been included. ODOT will complete further traffic analysis in Step 6 to determine if a shorter turn lane would still provide acceptable LOS at this location. Closure of these local roadways under CSX could create a sense of isolation to the neighborhoods to the east.

It is anticipated that each of the East Section conceptual alternates would require the reconstruction of the existing E. 105th bridge over NS Nickel Plate trench to facilitate the widening of E. 105th Street from two lanes to five. Due to the recent relocation of the RTA train station platform from E. 105th Street to Quincy Avenue, it appears that the span arrangements for the E. 105th Street bridge could be reconfigured and a shallower structure depth utilized to maintain or improve the existing vertical clearance over RTA and NS Nickel Plate lines. This situation will be further examined during Step 6 of the PDP when vertical alignments are developed. This work would be performed using conventional construction techniques and containment structures would be required to maintain rail traffic during construction. Local construction access appears to be available and was utilized on the recent E. 105th Street bridge rehab.

If adequate vertical clearance over NS Nickel Plate cannot be obtained through use of a shallower structure depth for E. 105th Street, then the profile of the boulevard would need to be raised. This would not allow for sufficient vertical clearance for Quincy Avenue under CSX immediately east of E. 105th Street and would also require the replacement of Quincy Avenue over NS Nickelplate. Alignment and profile revisions to CSX rail traffic would be difficult due to physical constraints to the north. Another option would be to close Quincy Avenue east of E. 105th Street and reroute this traffic via Woodland Avenue to E. 93rd Street to the boulevard. This has been initially discussed with the City of Cleveland and would be further evaluated in Step 6 for any build alternates recommended for further study.

3.11 Section 4(f) Resources

Section 4(f) resources include publicly owned parks and recreation areas, wildlife and waterfowl refuge areas. Section 4(f) also applies to planned resources if the agency that owns the property has formally designated the property for one or more of these uses. Historic, archaeological, or cultural sites are also considered Section 4(f) resources if they are included on or eligible for nomination to the National Register of Historic Places. **Sections 3.3.4.1, 3.6,** and **3.7** include descriptions of Section 4(f) resources within the study area.

Conceptual Alternatives Impact Assessment

No impacts to Section 4(f) public parks and recreational resources are anticipated in the West and East Sections.

Table 3-16 contains a listing of Section 4(f) public parks and recreational resources within the study area. Each of the resources shown in **Table 3-16** is located in the Central Section of the proposed project. The table also summarizes potential Section 4(f) impacts (i.e., use of the resource) that would result from the Central Section conceptual alternatives proposed Opportunity Corridor project.

Table 3-16: Section 4(f) Public Parks and Recreational Resources

Resource Location/Address	Potential Impacts		
	Central Alternate A	**Central Alternate B**	**Central Alternate C**
Kenneth Johnson Recreation Center (Formerly Woodland Recreation Center)			
9206 Woodland Avenue	Possible – widening of Woodland Avenue for boulevard adjacent to property	Possible – widening of Woodland Avenue adjacent to property	None
Planned Expansion of Kenneth Johnson Recreation Center			
Planned recreational facilities between E. 89th Street, Woodland Avenue, E. 93rd Street, and Buckeye Avenue.	Yes – Uses portions of 7 parcels (0.09 acres) to widen Woodland Avenue for boulevard and widening Buckeye Rd.	Yes – Uses portions of 8 parcels (0.09 acres) to widen Buckeye Rd.	Yes – Uses 8 whole parcels and portions of 20 parcels (1.57 acres) for boulevard and widening of Buckeye Rd.
Dell Playground			
E. 75th Street/Dell Avenue	None	None	None

As mentioned previously, no impacts to the Dell Playground are anticipated as a result of the proposed Opportunity Corridor project.

Central Alternate A would use a section of existing Woodland Avenue on the north side of the Kenneth Johnson Recreation Center. This section of roadway would be widened to accommodate the proposed Opportunity Corridor boulevard facility. Based on the conceptual alternatives, the widening of Woodland Avenue would not require use of property associated with the existing or planned recreation center property. ODOT will further assess potential noise effects in this area as part of future PDP steps. Central Alternate A would also widen the Buckeye Road approaches on both sides of the proposed Opportunity Corridor. This widening would constitute a use of a Section 4(f) resource since portions of the parcels needed to construct the transportation improvements have been formally designated by the City of Cleveland as planned recreational use. The widening of Buckeye Road would require portions of 7 parcels and approximately 0.09 acres of the planned recreation center expansion area. The total area of the recreation center after the planned expansion is approximately 11.7 acres. Consequently, less than one percent (0.76%) of the planned recreation center would be impacted by the proposed project.

Central Alternate B would widen existing Woodland Avenue to the north side in the area of the recreation center. Based on the conceptual alternatives, the widening of Woodland Avenue would require use of property associated with the existing recreation center to construct the transportation improvements. ODOT will further assess potential noise effects in this area as part of future PDP steps. Central Alternate B would also widen the Buckeye Road approaches on both sides of the proposed Opportunity Corridor. This widening would occur primarily to the north side of Buckeye Road and would constitute a use of a Section 4(f) resource, since portions of the parcels needed to construct the transportation improvements have been formally designated by the City of Cleveland as planned recreational use. The widening of Buckeye Road would require portions of 8 parcels and approximately 0.09 acres of the planned recreation center expansion area. The total area of the recreation center after the planned expansion is approximately 11.7 acres. Consequently, less than one percent (0.76%) of the planned recreation center would be impacted by the proposed project.

Central Alternate C would not impact the existing recreation center. The proposed mainline alignment and associated widening on the Buckeye Road approaches would require acquisition of right-of-way (approximately 1.57 acres) associated with the planned expansion of the recreation center. This would impact approximately 16.4% of the planned recreation center area. Consequently, a Section 4(f) use is also anticipated with Central Alternate C. Central Alternate C would also realign a portion of E. 93rd Street located to the southeast of the existing recreation center. Because this proposed realignment would not encroach on the existing or planned recreation center property, no Section 4(f) impacts are anticipated. However, coordination with the OSHPO will be conducted to ensure that the proposed modifications do not have an adverse effect, as defined in Section 106 of the National Historic Preservation Act of 1966, on the identified historic resource.

Table 3-17 summarizes the potential direct impacts to Section 4(f) historic resources for the Central and East Sections. No impacts to Section 4(f) historic resources are anticipated in the West Section.

Central Alternate A would use a section of existing Woodland Avenue on the north side of the Kenneth Johnson Recreation Center. This section of roadway would be widened to accommodate the proposed Opportunity Corridor boulevard facility. The widening of Woodland Avenue would not require use of property from the existing recreation center property. ODOT will further assess potential noise effects in this area as part of future PDP steps. ODOT will also coordinate with the SHPO to ensure that the proposed modifications do not have an adverse effect, as defined in Section 106 of the National Historic Preservation Act of 1966, on the NRHP-eligible recreation center.

Central Alternate B would widen existing Woodland Avenue to the north side in the area of the recreation center. No property from the existing recreation center would be required to construct the transportation improvements. Central Alternate B would also widen existing Buckeye Road opposite the St. Elizabeth's Magyar Roman Catholic Church. The widening would not require use of property from the existing church property. ODOT will further assess potential noise effects in these areas as part of future PDP steps. ODOT will also coordinate with the SHPO to ensure that the proposed modifications do not have an adverse effect, as defined in Section 106 of the National Historic Preservation Act of 1966, on these identified resources.

Central Alternate C would require use of property associated with the St. Elizabeth's Magyar Roman Catholic Church to construct the proposed boulevard and corresponding intersection with Buckeye Road. This would constitute a Section 4(f) resource impact. Similar to Central Alternate B, Buckeye Road would also be widened in the area of the church. ODOT will further assess potential noise effects in this area as part of future PDP steps. Additionally, ODOT will coordinate with the SHPO to ensure that the proposed modifications do not have an adverse effect, as defined in Section 106 of the National Historic Preservation Act of 1966, on the identified historic resource.

Table 3-17: Section 4(f) Historic Resource Preliminary Impacts – Central and East Sections

Historic Resource	Status[11]	Potential Impacts		
		Alternate A	Alternate B	Alternate C
Central Section				
Woodland Cemetery	NRHP	None	None	None
St. Elizabeth's Magyar Roman Catholic Church	NRHP	None	Possible – widening of Buckeye Road opposite from Church	Possible – widening associated with boulevard and widening of Buckeye Road opposite from Church
Kenneth Johnson Recreation Center (formerly Woodland Recreation Center)	NRHP-eligible	Possible – widening of Woodland Avenue for boulevard opposite from property	Possible – widening of Woodland Avenue opposite from property	None
East Section				
Cleveland Club/Tudor Arms	NRHP	Possible – widening of Carnegie Avenue	Possible – widening of Carnegie Avenue	Possible – widening of Carnegie Avenue
Hanna Monument (Resource CUY-06129-05)	NRHP-eligible	None	None	None
Kossuth Monument (Resource 06130-05)	NRHP-eligible	None	None	None
Wade Park Historic District	NRHP	Possible – widening of E. 105th St. and intersection with Chester Avenue	Possible – widening of E. 105th St. and intersection with Chester Avenue	Possible – widening of E. 105th St. and intersection with Chester Avenue
Pentecostal Church of Christ	NRHP-eligible	Possible – widening of E. 105th St. and intersection with Chester Avenue	Possible – widening of E. 105th St. and intersection with Chester Avenue	Possible – widening of E. 105th St. and intersection with Chester Avenue
Epworth Euclid Methodist Church (Resource CUY-00283-05)	NRHP-eligible	None	None	None
Park Lane Villa (Resource CUY-00369-05)	NRHP-eligible	Possible – widening of E. 105th St.	Possible – widening of E. 105th St.	Possible – widening of E. 105th St.
Wade Park Manor (Resource CUY-00292-05)	NRHP-eligible	None	None	None
The Temple	NRHP-eligible	Possible – widening of E. 105th St.	Possible – widening of E. 105th St.	Possible – widening of E. 105th St.

The widening of E. 105th Street and Carnegie Avenue as part of East Alternates A, B, and C would require right-of-way acquisition from the Segelin's Florist Building, the Pentecostal Church of Christ, The Temple, and the Cleveland Club/Tudor Arms. ODOT will further assess potential noise effects in this area as part of future PDP steps. ODOT will also coordinate with the SHPO to ensure that the proposed modifications do not have an adverse effect, as defined by Section 106 of the National Historic Preservation Act 1966, on the identified historic resources.

3.12 Section 6(f) Resources

Section 6(f) of the Land and Water Conservation Fund Act (LWCF) concerns transportation projects that propose to convert outdoor recreation property that was acquired or developed with LWCF grant assistance.

According to information obtained from the City of Cleveland, LWCF funds were used to construct the aquatic playground and site improvements at the Kenneth Johnson Recreation Center (formerly known as "Woodland Park"). Although the project boundary map is difficult to read, a review of aerial photography indicates that these improvements appear to have been constructed immediately south of the Recreation Center building located in the southwest quadrant of the intersection of Woodland Avenue and E. 93rd Street. As part of the construction, it appears that a segment of Kennedy Avenue was converted to a private driveway and surface parking lot for the recreational facility.

Conceptual Alternatives Impact Assessment

Based on the information provided by the City of Cleveland, it is anticipated that none of the conceptual alternatives would require conversion of property acquired or developed with LWCF monies to a non-recreational use.

3.13 Noise

Noise screening analyses completed during Step 5 of ODOT's PDP are intended to provide a preliminary review of potential noise impacts along a proposed project. The screening follows the basic outline of the FHWA procedures explained in the next section in a more streamlined manner, identifying areas along the corridor that could potentially approach or exceed the ODOT/FHWA's Noise Abatement Criteria (NAC), estimates noise abatement costs for the areas approaching or exceeding the NAC, and presents noise measurement locations for ODOT's

[11] Ibid.

approval. Noise Screening was performed in June 2010, and a report documenting the project findings was submitted to ODOT for review concurrent with this *Conceptual Alternatives Study* document.

Conceptual Alternatives Impact Assessment

The Noise Screening barrier analysis reviewed noise mitigation for residences and vacant lots along the West, Central and East Section alternates where noise mitigation was feasible. Based on estimated noise barrier costs the following locations are potentially cost reasonable:

West Section:

- Alternate B – West of E. 55th along north along Praha Ave.
- Alternate C – South side along proposed boulevard from quadrant roadway to E. 64th Street

Central Section:

- All Alternates - South side along proposed boulevard from E. 75th to E. 79th Street
- Alternate B – West side along proposed boulevard from NS mainline to Buckeye Road
- Alternate C – West side along proposed boulevard from Buckeye Road to E. 93rd Street

East Section:

- No noise are feasible due to property access constraints

An ambient noise measurement program will be coordinated for any build alternatives recommended for further study. Design hour noise levels would be modeled at individual representative properties along the corridor for each of the identified feasible alternatives. The modeling would result in a more refined noise barrier analysis and updated cost estimates for feasible and reasonable noise mitigation.

In addition to permanent noise impacts, construction related activities could also create noise impacts to residential communities. For noise sensitive locations, restrictions to hours of construction could be required. Additional coordination with the City of Cleveland would be required determine specific noise related construction requirements.

3.14 Air

Projects listed on the ODOT's Statewide Transportation Improvement Program (STIP) and/or NOACA's Transportation Improvement Plan (TIP) are required to have Mobile Source Air Toxics (MSAT), Particulate Matter (PM2.5), Ozone, and Carbon Monoxide (CO) pollutants addressed as part of the National Environmental Policy Act (NEPA) process.

The Clean Air Act Amendments of 1990 identified 188 air toxics, also known as hazardous air pollutants, and addressed the need to control toxic emissions from transportation sources. In 2001, the Environmental Protection Agency (EPA) issued its first Mobile Source Air Toxics Rule. More recently, EPA issued a second MSAT Rule in February 2007 which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The EPA has identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://cfcpub.epa.gov/ncea/iris/index.cfm). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. The rule also identified several engine emission certification standards that must be implemented. Unlike the criteria pollutants, toxics do not have National Ambient Air Quality Standards (NAAQS) associated with them which makes evaluation of their impacts more subjective[12].

An air quality screening was performed in June 2010, and a report documenting the project findings was submitted to ODOT for review concurrent with this *Conceptual Alternatives Study* document.

Based on the Air Quality Screening it is proposed that:

- MSAT analysis, based on projected ADT, would follow FHWA's Qualitative Analysis procedures. The MSAT analysis would be conducted during PDP Step 6.
- Based on ODOT's PM2.5 Conformity Process Flowchart, ADT and diesel truck volumes, ODOT will add the project to the list of other STIP projects that meet the criterion and submit to FHWA for a conformity determination
- Ozone will be addressed through STIP/TIP conformity determination
- Based on ODOT's ADT thresholds, a quantitative CO analysis will be prepared as part of Step 6 of the PDP

3.15 Utilities

During Steps 1-4 of the PDP, record utility plans were obtained by SO-Deep, USPC. This data was reviewed by ODOT and major utility facilities were incorporated into the Red Flag Mapping contained in the *Existing and Future Conditions Report*[13]. This data was used during development of the Step 1-4 alternatives. The project study area was revised during Step 5, and additional utility data was obtained for areas beyond the limits of the original study area.

A utility coordination meeting was held on May 13, 2010 at the ODOT district office. The purpose of the meeting was to inform the potentially affected public and private utility owners about the scope of the project; the steps of ODOT's major project development process; the conceptual alternatives developed during Step 5; the status of project funding; and the potential implementation schedule. Copies of the red flag mapping showing major utility facilities were on display, and extra copies of the mapping were made available for the utilities to mark their facilities on. During the presentation, the utility companies were asked to confirm that their major utility facilities were included on the mapping and to inform ODOT of other existing or planned utility facilities that could be affected by construction.

Conceptual Alternatives Impact Assessment

Major utilities were identified within each of the three geographic sections of the project and are identified within the evaluation matrix as concerns/impacts (see **Appendix B**). Impacts to major utility infrastructure could negatively affect project construction costs or require additional relocation costs for private utilities that serve the public. Therefore, impacts to these facilities should be avoided where feasible and should be considered as the project continues through the PDP. Actual impacts to some existing underground utilities will not be able to be determined until final project mapping is obtained and additional project design efforts are performed. These efforts primarily include development of preliminary vertical alignments and cross sections and the establishment of conceptual sewer locations.

Major utilities identified in the West Section include:

- NEORSD 78" interceptor, 16" sludge force main, 96" combined sewer and 30" water transmission main along E. 55th Street
- 108" combined sewer in Kingsbury Valley
- NEORSD CSO regulators at Grand, Kinsman and E. 55th Street
- fiber optic along E. 55th Street and NS Nickelplate line
- 8" gas main along Kinsman; large OH electric along Bower

West Section Alternates B and C may require relocation of underground utility infrastructure at E. 55th Street.

Major utilities identified in the Central Section include:

- NEORSD interceptor along Woodland (27" - 33"); Buckeye (60"- 72") and E. 79th Street
- 80" combined sewer along E. 79th Street
- NEORSD Regulator at E. 79th Street/Grand Avenue
- 5 fiber optic lines along NS Cleveland line
- fiber optic along NS Nickelplate line
- power transmission towers parallel to NS Cleveland line

[12] http://www.fhwa.dot.gov/environment/airtoxic/index.htm, accessed September 14, 2010.

[13] HNTB Ohio, Inc. *Opportunity Corridor Existing and Future Conditions, Cleveland, Cuyahoga County, Ohio*. April 2006.

- water transmission lines along Quincy (48"), Woodland (48" & 30") and E. 93rd Street (30")
- 8" gas main along E 79th Street

The railroad structure construction at NS Cleveland line would require fiber optic coordination and potential relocation. Railroad runaround structures at NS Cleveland line could impact up to four power transmission lines.

Major utilities identified in the East Section include substantial underground utility infrastructure along E. 105th Street including:

- 36" water transmission main
- 36 duct telephone bank
- 8.5" gas main
- 105" NEORSD interceptor sewer
- 48 electrical ducts
- Additional proposed underground electric is also planned to service Cleveland Clinic campus

No major conflicts with existing utilities were identified in the East Section. However, impacts may be identified as project mapping and design advances to a greater level of detail. ODOT will continue to coordinate with utility companies and municipal service providers to avoid potential utility impacts where feasible and practicable.

3.16 Maintenance of Traffic

Due to the length and size of the project, it is likely that the proposed roadway construction would be divided into two to three geographic sections for purposes of construction. The limits of the sections could be similar to the boundaries of the West, Central and East Sections designated for alternative development. Maintenance of traffic considerations within each section are described below and would be analyzed in detail during Step 6, when vertical alignments are developed.

Conceptual Alternatives Impact Assessment

East of E. 55th Street, the West Section would generally be constructed off-line from the existing arterial network. All alternates require the construction of bridges over the RTA train loop, as well as the RTA Blue and Green lines, which would require temporary containment structures to maintain transit service. Access to the RTA train maintenance facility from Grand Avenue would also need to be maintained for all alternates. It is anticipated that intersecting streets would be either widened or replaced using part width construction methods to maintain traffic. Maintenance of traffic considerations specific to each alternate are noted below:

- Vertical alignment of West Alternate A would be at existing grade at E. 55th Street while West Alternates B & C would be constructed below E. 55th Street. West Alternates B & C would likely require full or part closure of I-490 east of I-77 to facilitate bridge construction and vertical alignment changes, with West Alternate B being most difficult with three bridges and complex geometry. Woodland Avenue would likely be the detour route for I-490 while E. 55th Street traffic would be facilitated using part width bridge construction and sheeting.
- West Alternate B would require the advance relocation of the GCRTA substation at E. 55th Street in order to maintain rail service.

The Central Section alternates would generally be constructed off line from the existing arterial network. All alternates would be constructed at or near existing grade except at the NS mainline roadway underpass where lowering would be required. NS mainline rail traffic would be maintained using either single track operation or runarounds between the NS structure over RTA to the north and the RTA over NS structure to the south. Top down/jump span/roll in structures with very short closures are anticipated. It is anticipated that intersecting streets would be either widened or replaced using part width construction methods to maintain traffic. Maintenance of traffic considerations specific to each alternate are noted below:

- Central Alternate A would require the reconstruction and widening of Buckeye Road and the demolition of Woodland Avenue over the RTA Red line and NS Nickelplate line, which would require temporary containment structures to maintain rail service during construction.
- Central Alternate B would require the demolition of E. 89th Street over the RTA Red line and NS Nickelplate line, which would require temporary containment structures to maintain rail service during construction.
- Central Alternate C would require the replacement of the CSX rail structure over Woodland Avenue to facilitate widening of Woodland Avenue from four to five lanes. Sufficient space exists north of Woodland to construct a rail runaround to the north. South of the bridge, elimination of the Kennedy Avenue bridge would facilitate a railroad runaround. If the CSX bridge over Buckeye is required to be replaced, a rail runaround would require the removal of the Steinway and Yeakel Avenue structures and reconstruction of Steinway Avenue structure. Single track operation would negate replacement of these structures; however, further coordination with CSX would be required if this alternate is advanced to Step 6.

All East Section alternates require the reconstruction of the E. 105th Street over the RTA Red line and NS Nickelplate line, which would require temporary containment structures to maintain rail service during construction. Bridge construction may require complete closure of Quincy Avenue due to span reconfiguration. A complete closure was utilized during a recent rehab of the structure and therefore should be acceptable for this project. It is anticipated that intersecting streets would be either widened or replaced using part width construction methods to maintain traffic. There are no maintenance of traffic considerations specific to a given alternate.

3.17 Cost

The overall project cost for each alternate within each section is listed below in **Table 3-18** below. These values were developed using the most recent construction data available. Because the year of construction is unknown, the projected cost is in 2010 dollars. Costs include construction, engineering, inspection, right-of-way acquisition, relocation assistance, and a 20% construction contingency. Utility relocation costs were not received by the potentially affected utility companies and are not included in the estimates. It is also unknown at this time whether the proposed facility and development will be serviced by modifications to the existing utility infrastructure or will require a new utility infrastructure. Therefore, costs for new water mains, sanitary sewers, and power and communications are also not included. A detailed cost estimate for each conceptual alternate is included in **Appendix F**.

Table 3-18: Estimated Cost for Conceptual Alternatives

Section	Alternate A	Alternate B	Alternate C
West	$95,500,000	$145,800,000	$108,000,000
Central	$73,200,000	$83,500,000	$79,400,000
East	$22,800,000	$22,500,000	$21,900,000

Note: All estimated costs are in 2010 dollars.
Costs include construction, engineering, contract administration and inspection, right of way acquisition, relocation assistance and appropriate contingencies based on level of design detail.
Costs for utility relocations are not included.

4.0 Public Involvement

Public and stakeholder involvement is an integral element of this study. A summary of public involvement activities performed during PDP Steps 1-4 is included in the *Draft Strategic Plan* for the Opportunity Corridor project. This data is generally summarized below:

- Steering Committee – A 21-member committee was formed representing neighborhood and business interests in the project. Three steering committee meetings were performed.
- Stakeholder Meetings – Numerous stakeholder meetings were held at the request of local stakeholders and ODOT District 12. The meetings were held with local business owners, Community Development Corporations and local institutions.
- Website – A study website was developed and maintained by ODOT showing study developments, technical information, steering committee presentations and handouts (www.BuckeyeTraffic.org/OpportunityCorridor).

During PDP Step 5, additional public involvement was conducted, which included updates to steering committee membership; development of a project mailing list; property owner notification and study introduction letters; public meetings; community meetings; business meetings; stakeholder meetings and stakeholder surveys. In addition, the project website has been continually updated, and a project newsletter was produced and distributed. Detailed summaries of the public meetings and neighborhood meetings, including a summary of public Q&A is included in the *Public Involvement Summary* included in **Appendix D**. This chapter summarizes public involvement efforts completed during PDP Step 5.

4.1 Steering Committee

The public involvement for the study is being coordinated through a project Steering Committee representing transportation and community interests in the study area. Steering Committee members represent:

- Buckeye Area Development Corporation
- Buckeye Community
- Burten Bell Carr Development Corporation
- City of Cleveland
- City of Cleveland Council (Wards 5, 6, and 12)
- Cuyahoga County
- Cuyahoga County Engineer's Office (CCEO)
- Early Stage Partners, LP
- Fairfax Community
- Fairfax Renaissance Development Corporation
- Greater Cleveland Partnership (GCP)
- Greater Cleveland Regional Transit Authority
- Kinsman Community
- New Era Builders
- Northeast Ohio Areawide Coordinating Agency (NOACA)
- North Shore Federation of Labor
- Ohio Department of Development
- Ohio Department of Transportation (ODOT)
- Orlando Baking Company
- Slavic Village Development Corporation
- Slavic Village/St. Hyacinth Community
- State of Ohio
- The Plain Dealer
- University Circle Community
- University Circle, Inc.

Updates to the steering committee membership were performed during Step 5 to include residents from the affected neighborhoods to provide additional community representation.

Steering Committee meetings were held on September 1, 2009, March 11, 2010, and September 8, 2010. The first meeting was held at Greater Cleveland Partnership's Facility. Presentations were given by ODOT, GCP, and the City of Cleveland. This meeting provided an overview of the study process, the goals and objectives, a summary of the information gathered to date, and the preliminary alternatives. The input received during the meeting was used to refine the information presented at Public Meeting #1.

The second Steering Committee meeting was held at the Karamu House in Cleveland. Presentations were given by ODOT, GCP, and the City of Cleveland. ODOT's presentation focused on details regarding the conceptual alternatives developed during PDP Step 5. GCP provided an overview of the comments received to date from the public involvement activities. A GCP consultant gave a presentation focused on two of the city's Opportunity Corridor Development Districts.

The third committee meeting was held at the Cleveland Plain Dealer. Presentations were given by ODOT and the City of Cleveland. The City's presentation provided an overview of land use changes recently adopted by the City of Cleveland. ODOT's presentation provided an evaluation of the conceptual alternatives developed during Step 5 and the recommendation of alternatives to be further developed during Step 6.

4.2 Public Meetings

The first set of public meetings for the Opportunity Corridor Study was held on Tuesday, September 22, 2009. To increase attendance, two public meetings were held. A daytime meeting was held from 11:30 AM to 1:30 PM, and an evening meeting was held from 6:00 PM to 8:00 PM. The daytime meeting was held at the Cleveland Play House to capture the people who work in and around the study area. The evening meeting was held at Mt. Sinai Baptist Church for those who could not attend the daytime meeting, specifically people who live in the study area and work during the day. ODOT's presentation focused on the Project Development Process (PDP); the project Purpose and Need, preliminary alternatives, evaluation of preliminary alternatives and recommendations for alternatives to be studied during PDP Step 5. The meeting included a formal public comment period.

Following the public meetings, the comments received were transcribed and reviewed by ODOT to ensure that the public's concerns were incorporated into the conceptual alternatives development and evaluation process. In general, the public agreed with the conceptual alternatives recommended for further study in Step 5. The comments indicated that the opportunity for economic development with the more southern alignments (Alternatives 2 and 4) was desirable. This is consistent with ODOT's screening process and affirms the recommendation of conceptual alternatives to be studied further in Step 5 of the PDP. Other comments suggested both concern and support for a grade-separated intersection at E. 55th and I-490. The public wanted to maintain local access while still improving traffic operations. After hearing this, ODOT developed and evaluated the quadrant roadway option. Another major concern of the public was the impacts of the project to residents and businesses. The project team continued to work to avoid and minimize these impacts during the development of alignment details in Step 5. Additional alternates within each geographic section to provide more options. ODOT also refined the screening process to make displacements to homes, businesses, and churches an explicit consideration in the decision-making process. Other community goals voiced by the public included making the area more multi-modal and beautifying the neighborhoods. The proposed boulevard is designed to include bike and pedestrian facilities that would improve multi-modal access and mobility. Although the alternatives are still at the conceptual stage, ODOT recognizes that aesthetic enhancements are important to the public and they will be evaluated at the appropriate time in the design process.

The public meetings were advertised in the newspapers. Notices were also sent to the study mailing list. The meeting was preceded by both print and broadcast media coverage. More detailed information, including number of attendees, advertisement methods, meeting summaries, comments received, and concerns expressed from attendees at these meetings can be found in **Appendix D**. Copies of materials used for the public meetings (e.g., handouts, presentations, display boards) are on file at ODOT District 12 and are available on the study website (www.BuckeyeTraffic.org/OpportunityCorridor).

4.3 Business Meetings and Stakeholder Interviews

Following the first set of public meetings, a business coordination meeting was held to present the study to the local business community. This meeting was held on Tuesday, December 8, 2009, at the Cleveland Playhouse. This meeting was advertised via flyers that were mailed to all businesses within the GCP-defined community benefit area for the Opportunity Corridor project.

The meeting format was similar to that of the public meeting. The doors to the meeting were opened at 9:30 AM to allow attendees to browse exhibits and review information about the project. Members of the project study team were also available to answer questions regarding the project. At 10:00 AM, individuals from the Greater Cleveland Partnership, City of Cleveland, and ODOT provided an overview of the study process, the goals and objectives that had been developed by ODOT and FHWA in coordination with the Steering Committee, a summary of the information gathered to date, and the conceptual alternatives. After the presentation, a formal question and answer session was held.

The comments from the business coordination meeting were transcribed and reviewed by ODOT to ensure that the business stakeholder concerns were incorporated into the conceptual alternatives development and evaluation process. The business owners' concerns focused mainly on the relocation and construction process. The businesses that may need to be relocated wanted to be kept informed on the acquisition process as well as the timeline for determining a final alignment alternative so they can plan accordingly. Businesses within the study area that will not need to be relocated were concerned about access for their customers during construction of the Boulevard. ODOT will continue to keep all stakeholders informed on the alternative selection and acquisition processes as the project moves forward. Maintenance of traffic during construction will be evaluated in more detail in Step 6 of the ODOT Project Development Process. Overall, there were no comments heard that would change which alternatives were recommended for further study.

A questionnaire containing two different sets of questions was distributed. The first set of questions was developed to better understand community assets and concerns. A second series of questions asked about meeting scheduling so that the ODOT and FHWA could best align public involvement activities to meet the general needs of the businesses, their owners, and their employees. Following the meeting, handouts and questionnaires were mailed to all businesses within the study area that were not in attendance at the meeting. Detailed information from the business coordination meeting, including summaries, comments, and concerns from the business meeting can be found in **Appendix D.**

Individual meetings and interviews were also conducted within the study area. Meetings and interviews were conducted with business owners, employees, and patrons at over twenty locations within and immediately surrounding the study area. Additional meetings were conducted by the City of Cleveland and GCP. Interviews focused on gathering information relative to the individual or business's function and relationship to the study area. Interviews were conducted with varied interests within the study area and included industrial manufacturers, food processing businesses, small retail and service businesses, recreation centers, community support facilities, schools and residents. These interviews also provided feedback regarding the effectiveness of public information activities to date. Results of this data and corresponding analysis was used in the development of conceptual alternatives and is being incorporated into an update of the Public Involvement Plan which is currently being refined for future public involvement activities. The intent of updating the Public Involvement Plan is to maximize inclusiveness of all stakeholders in the public involvement process.

4.4 Community Meetings

Following the public meetings, neighborhood meetings were conducted in each of the neighborhoods located in the project study area (i.e., Fairfax, University Circle, Slavic Village or North Broadway, Kinsman, and Buckeye). A similar meeting format was used for each meeting to share project information with residents, give them an opportunity to ask questions, and to allow the project study team to learn more about each neighborhood. The dates of these meetings were as follows:

- Fairfax - November 12, 2009
- University Circle - January 26, 2010
- Slavic Village - January 28, 2010
- Kinsman - February 3, 2010
- Buckeye - March 9, 2010

The doors to the meeting were opened to allow attendees to browse exhibits and review information about the project for about thirty minutes prior to a formal presentation. Members of the project study team were also available to answer questions regarding the project. Each attendee signed in and marked the location of their residence on a study area map. The project team presented an overview of the study process, the goals and objectives, a summary of the information gathered to date, and the conceptual alternatives under consideration. After the presentation, a formal question and answer session was held.

The comments received during the neighborhood meetings were transcribed and reviewed by ODOT to ensure that the expressed concerns were incorporated into the conceptual alternatives development and evaluation process. The main themes of the residents' comments were concerns over relocation and concern about how the local neighborhoods will benefit from the project. As a result of these comments the federal relocation process has been incorporated into the presentations for the Step 5 public meetings. The project team also continued to work to avoid and minimize these impacts during the development of alignment details in Step 5. Economic development and workforce development efforts are being performed by the city of Cleveland. If development occurs, it could create more local jobs in both the short-term and the long-term. Constructions jobs would be created to build the Boulevard itself, and future development would provide construction and permanent job opportunities. The Boulevard design is also meant to encourage community cohesion and revitalize the surrounding neighborhoods by making it a more multi-modal environment that includes green and aesthetically pleasing design elements. ODOT is committed to this community goal and has integrated the Context Sensitive Solutions (CSS) design process into the alternatives development process. CSS has been and will continue to be included in both the stakeholder and public involvement process. This means that the public has been engaged in partnership with the City, GCP, and ODOT to assess corridor constraints and opportunities, examine road improvement and urban design alternatives and develop workable design concepts, designs and guidelines for the corridor.

During the neighborhood meetings, a breakout session was held after the public comment period where the meeting attendees broke into small groups with members of the project team. The project team led a map exercise, a CSS exercise, and provided questionnaires to neighborhood residents for completion. The CSS exercise provided information to the project team regarding important destinations within the immediate community, the mode of transportation currently used to travel as well as barriers to using various modes of transportation. Questionnaires allowed participants to also comment on: travel modes, barriers to travel, what they like and dislike about their neighborhood, and what improvements they would like to see for their neighborhood. Detailed information, including advertising methods, meeting summaries, and comments received during the community meetings can be found in **Appendix D.**

4.5 Study Newsletter

A newsletter providing updates on the alternatives under consideration, major study decisions, and any changes in the project development has been developed for the project. It was mailed ten days in advance of the Step 5 public meetings. Newsletters were distributed using the names and addresses found on the most current version of the project mailing list. Additional copies of the newsletter were provided to committee members for distribution to their constituencies, and an Adobe PDF version is available on the study website (www.BuckeyeTraffic.org/OpportunityCorridor).

4.6 Study Website

A public-access website has been created by ODOT to disseminate study information and to solicit public comments. ODOT hosts the project website located at the following address www.BuckeyeTraffic.org/OpportunityCorridor. The website contains Steering Committee information, presentation information, public comment forms and other relevant historic data related to the development of the project.

4.7 Mailing List

A mailing list for the project was developed for the project at the beginning of Step 5. The mailing list was initially developed using county auditor data for all property owners within the study area. This list was utilized for property owner notification letter distribution. The list has since been updated to include addresses for individuals signing in at the public and neighborhood meetings. In addition, a mail service was utilized to expand the mailing list to include all current physical mailing addresses within the study area. The most current version of the mailing list was utilized for distribution of newsletters and announcements of the next public meeting. Project information is being mailed requesting return service so that all returned mail can be evaluated and the database updated when possible.

5.0 Conclusions and Recommendations

At the end of Step 4 of the Ohio Department of Transportation's (ODOT) Project Development Process (PDP), a total of two conceptual alternatives and the No Build alternative were identified for further study in Step 5. During Step 5, the study area was divided into three geographic sections (West/Central/East), as shown in **Figure 2-4, page 9**. Three different alternates for a new boulevard (A/B/C) were developed within each geographic section. Each of the alternates is compatible with those in the adjacent geographic section. Taken individually, the conceptual alternates within each section are a component of an overall Opportunity Corridor alternative. Consequently, there are a total of twenty-seven build conceptual alternatives for the proposed Opportunity Corridor project. These conceptual alternatives were further refined during Step 5 based on environmental studies, traffic analysis, refinement of horizontal alignments, cost estimates, utilities coordination, and stakeholder coordination.

The Conceptual Alternatives Evaluation Matrix, which is located in **Appendix B**, provides a summary of impacts of the No Build alternative and the conceptual build alternates within each geographic section. The following sections present summary discussions of the No Build alternative, each conceptual alternate, and recommendations for feasible alternatives to be carried forward and studied in Step 6 of the PDP.

5.1 No Build Alternative

The No Build alternative makes no transportation system improvements within the project study area. Ongoing maintenance activities would continue to be performed by the City of Cleveland. Prior to the rapid expansion of the highway system, the project study area was heavily reliant on rail infrastructure due to its prominent role in the transport of manufactured goods. Consequently, communities located themselves in proximity to rail infrastructure that was critical to their livelihood. Over time, as the national manufacturing base declined and trucks replaced rail as the most efficient method of transporting and distributing goods, the overall economic vitality of the study area declined. This decline manifested itself in the form of lost jobs, population exodus, and diminishing community fabric. Additionally, the rail infrastructure, which once serviced the industrial activity with the area, along with the presence of the Kingsbury Run Valley, now serve as barriers to vehicular, bicycle and pedestrian access and mobility. The net effect of this diminished access and mobility has resulted in an area referred to locally as the "Forgotten Triangle". This area is bounded Woodland Avenue on the north, Woodhill Road/E. 93rd Street on the east, and Kinsman Road on the south and west.

Economic and community development within the 10 development districts described elsewhere in this document could still occur with the No Build alternative. However, this development would not be supported by any type of proposed transportation investment and would therefore likely occur over a much longer period of time.

The No Build alternative would not directly impact any natural environment resources, social environment resources, community resources or environmental justice populations as a result of a transportation investment. Economic revitalization and community development could occur in the project study area and the 10 development districts identified by the City of Cleveland. However, the lack of investment in transportation infrastructure to support these activities would likely cause them to be spread out over a much longer period of time. In addition, new developments may not have the long-term staying power or the potential to create as great of an economic boost to the area. It is anticipated the lack of infrastructure investment associated with the No Build alternative would be more likely to perpetuate historic trends of declining economic activity and population exodus. Indirectly this would impact environmental justice populations by perpetuating the current lack of community cohesion, community services and job opportunities. In fact, since the study was initiated in 2004, field reviews have indicated continual demolition of abandoned residential and industrial facilities. Indirectly maintaining current conditions would impact environmental justice populations by not providing improved access and mobility. It would perpetuate the current lack of community cohesion, reduced community services and job opportunities through potential development activities.

Given the above, the No Build alternative is not anticipated to address the project Purpose and Need. However, it will be carried for further study as the basis of comparison for the build alternatives.

5.2 Build Alternatives

Each of the build alternatives would meet the purpose and need developed for the proposed project. Each build alternative would provide improved access and mobility to/from the interstate system to the local neighborhoods, including University Circle. Additionally, access to development districts identified by the City of Cleveland would also be enhanced. All build alternatives would also provide a potential for new local and express bus service and the addition of sidewalk and a multi-purpose path along the proposed boulevard and intersecting local roadways.

The build alternatives would provide both benefits and impacts to the surrounding community, which includes environmental justice populations. Some of these potential benefits include:

- Improved traffic operations on E. 55th Street
- Improved access to recreational amenities such as Kenneth Johnson Recreation Center, the proposed Kingsbury Run Connector Path in the Kinsman neighborhood, and the proposed Lake to Lakes trail in University Circle
- Potential for local jobs through creation of re-development opportunities
- Potential support of existing commercial business through increased traffic
- Removal of abandoned structures within proposed right-of-way
- Relocation benefits to residences and businesses desiring to move
- Clean-up of sites of environmental concern within proposed right-of-way
- Opportunity for enhanced neighborhood identity through gateways, wayfinding and public art
- Aesthetic enhancement opportunities along proposed boulevard
- Enhanced security through street lighting, as well as traffic- and pedestrian-generated human presence

Potential impacts would include:

- Residential and business displacement (within identified Environmental Justice areas)
- Potential increases to traffic along intersecting streets
- Potential increases in noise level over existing conditions
- Temporary construction impacts
- Modifications to local street network

5.2.1 West Geographic Section

The conceptual alternates developed for the West Geographic Section are located in the Saint Hyacinth and Kinsman neighborhoods between I-77 and E. 75th Street. This section includes the intersection of E. 55th Street and I-490. All of the alternates would involve a new boulevard facility with three through lanes in each direction separated by a raised median. Turn lanes would be provided at intersecting streets, as required. Each alternate within the West Geographic Section shares some similar features and impacts.

All of the West Section alternates will have similar environmental impacts. It is anticipated that there would be no impacts to NRHP-listed or NRHP-eligible sites, or Cleveland Landmark sites. Section 4(f), Section 6(f), or ecological impacts associated with the proposed alternates are also not anticipated.

Each of the alternates impacts a similar number of properties with potential environmental contamination.

Each of the alternates include commercial and residential displacements within an environmental justice area. Relocations for each alternate are anticipated to impact environmental justice populations.

None of the West Section alternates would create impacts to freight rail operations. All of the alternates would impact GCRTA. Each would require a bridge structure over the RTA train loop in the Kingsbury Run Valley and a bridge over the Blue/Green line tracks. Temporary impacts could be created during bridge construction. In addition, revised drive access from Grand Avenue to the train maintenance facility would be required for each alternate.

Substantial underground utility infrastructure exists that causes concern for all alternates within the West Section. These utilities include a NEORSD 78" interceptor, 16" sludge force main, 96" combined sewer and 30" water transmission main along E. 55th Street, 108" combined sewer in the Kingsbury Run Valley, NEORSD CSO regulators at Grand, Kinsman and E. 55th Street, fiber optic along E. 55th Street and NS Nickelplate line, 8" gas main along Kinsman, and large OH electric along Bower Avenue which supplies power to GCRTA's substation. West Alternates B and C have the greatest potential for utility impacts due to the need to depress the boulevard under E. 55th Street.

The following sections summarize the key considerations associated with each alternate within the West Section.

5.2.1.1 West Alternate A

West Alternate A would consist of an at-grade conventional four-legged signalized intersection at the terminus of I-490 and E. 55th Street. Although this alternate will provide improved access and mobility, due to inadequate weaving distance, access from I-77 to northbound E. 55th Street would be redirected to Kinsman Road. New full access and direct access to the interstate system is created at Kinsman Road and E. 75th Street via the boulevard. The four-legged signalized intersection provides more conventional access to E. 55th Street in comparison to West Alternates B and C. Traffic operations for the at-grade intersection of I-490 and E. 55th Street would be substandard while LOS at this location is acceptable for West Alternates B and C. Additional capacity analyses would need to be performed after NOACA refines the future traffic volumes during Step 6 to determine if acceptable LOS can be obtained for the E55th Street intersection.

Approximately 32 residential structures and 6 commercial structures would be impacted. According to OR Colan Associates RAP Survey, West Alternate A appears to require fifty-eight (58) residential relocations with sixteen (16) owner occupants and forty-two (42) tenants. There are three (3) commercial businesses and twenty-two (22) landlords that are considered a business per the Uniform Act. Of the potential impacts, the Inner City Wrecking Co, a salvage yard may cause concern. In order to facilitate the relocation of this business, the appropriate City officials and departments would need to be contacted to determine specific zoning requirements. Estimated right-of-way acquisition and relocation costs for this alternate are $5,122,000.

Although some impacts to existing GCRTA transit facilities are anticipated with each of the West Section alternates, the proposed Opportunity Corridor project would not permanently restrict local access to GCRTA transit services. Each of the West Section alternates would require at least some modification/reconstruction of the E. 55th Street Rapid Transit Station or its appurtenant facilities. West Alternate A would require reconstruction of the E. 55th Street transit station parking lot and installation of a new signalized access from the boulevard to the parking facility.

West Alternate A is estimated to cost $95,500,000 in 2010 dollars. This alternate is the least expensive alternate in the West Section.

It is recommended that West Alternate A be carried forward for further study in Step 6.

5.2.1.2 West Alternate B

West Alternate B was developed to provide better operation and traffic flow than Alternate A. West Alternate B would depress existing I-490 under E. 55th Street just north of the existing I-490/E55th Street intersection with a system of ramps west of E. 55th Street. Although this alternate would provide improved access and mobility, access would not be provided between E. 55th Street and the boulevard. The proximity to I-77 would also require eastbound drivers to make multiple traffic decisions in a quick time frame. These items could create driver confusion for drivers looking to access E. 55th Street. New full access and direct access to the interstate system is created at Kinsman Road and E. 75th Street via the boulevard. Traffic operates at LOS C for the ramps and intersection of Kinsman Road and boulevard.

Approximately 23 residential structures and 5 commercial structures would be impacted. According to OR Colan Associates RAP Survey, West Alternate B has the least impact to structure takes and potential displacements. West Alternate B appears to require forty-eight (48) residential relocations with twelve (12) owner occupants and thirty-six (36) tenants. There are six (6) commercial businesses and seventeen (17) landlords that are considered a business per the Uniform Act. Of the potential impacts, the Inner City Wrecking Co and JBI Scrap Processor, both salvage yards, are the properties that may cause concern. In order to facilitate the relocation of these businesses, the appropriate City officials and departments would need to be contacted to determine specific zoning requirements. Estimated right-of-way acquisition and relocation costs for this alternate are $6,210,500.

West Alternate B would have the greatest impact to the E. 55th Street Rapid Transit Station in that it would require relocation and reconstruction of the RTA electric substation, as well as a structure to accommodate bus movement and parking at the station site.

West Alternate B would require a new bridge structure at E. 55th Street as well as three additional bridges for the ramp and mainline braiding proposed west of E55th Street.

West Alternate B is estimated to cost $145,800,000 in 2010 dollars. West Alternate B is the most expensive alternate in the West Section due to the structures required for the ramp and mainline braiding.

It is recommended that Alternate B be eliminated from further study due to driver expectancy/confusion concerns associated with the E. 55th Street access and the substantial increase in construction costs relative to the other alternates.

5.2.1.3 West Alternate C

Similar to West Alternate B, West Alternate C was developed to provide an option that would provide better operation and traffic flow at E. 55th than Alternate A. West Alternate C would depress existing I-490 under E. 55th Street at the existing I-490/E. 55th Street intersection. A quadrant roadway would be constructed in the vicinity of E. 59th Street to provide full access between E. 55th Street, the freeways, and the boulevard. New full access and direct access to the interstate system would be created at Kinsman Road and E. 75th Street via the boulevard. Traffic operates at LOS C for the quadrant roadway and the intersection of Kinsman Road and the boulevard.

Approximately 49 residential structures and 5 commercial structures would be impacted. According to OR Colan Associates RAP Survey, West Alternate C has the highest impact to residential structure takes and potential displacements. West Alternate C appears to require seventy-seven (77) residential relocations with twenty-five (25) owner occupants and fifty-two (52) tenants. There are three (3) commercial businesses and thirty (22) landlords that are considered a business per the Uniform Act. Similar to West Alternate B, of the potential impacts, the Inner City Wrecking Co and JBI Scrap Processor, both salvage yards, are properties that may cause concern. In order to facilitate the relocation of these parcels, the appropriate City officials and departments would need to be contacted to determine specific zoning requirements. Estimated right-of-way acquisition and relocation costs for this alternate are $7,117,400, much higher than West Alternates A and B.

West Alternate C, similar to Alternate A, would require reconstruction of the E. 55th Street transit station parking lot and installation of a new signalized access to the parking facility. Signalized access in Alternate C would be from E. 55th Street. West Alternate C may also result in longer pedestrian routing for some residents to the GCRTA transit station.

West Alternate C is estimated to cost $108,000,000 in 2010 dollars.

Although it has the highest residential impact of the three West Geographic Section alternates, West Alternate C provides the best traffic operations while providing full access to E. 55th Street. Therefore, it is recommended that Alternate C be carried for further study in PDP Step 6 and additional analysis be performed regarding the number of occupied units and the potential for finding available replacement housing within the St. Hyacinth neighborhood for those that may be impacted by this or any of the West Section alternates.

5.2.2 Central Geographic Section

The alternates developed for the Central Section are located in the Kinsman, Buckeye, and Fairfax neighborhoods between E. 75th Street and Quincy Avenue. All alternates share a common alignment between E. 75th Street and E. 79th Street. All alternates would involve a new boulevard facility with three through lanes in each direction, separated by a raised median from E. 75th Street through Buckeye Road. Central Alternate A would retain this lane use through Woodland Avenue, while Central Alternates B and C would reduce to two through lanes in each direction on the west approach to Woodland Avenue. For all alternates, turn lanes would be provided at intersecting streets, as required. Each alternate shares some similar features and impacts.

All of the Central Section alternates would require a new rail bridge to accommodate the proposed boulevard under the NS mainline which would create temporary impacts to freight rail operations.

No ecological impacts or Section 6(f) impacts are anticipated with any of the Central Section alternates.

Each of the alternates include commercial and residential displacements within an environmental justice area. Relocations for each alternate are anticipated to impact environmental justice populations.

Substantial underground utility infrastructure exists that causes concern for all alternates within the Central Section. These utilities include a NEORSD interceptor along Woodland Avenue (33"), Buckeye Road (72") and E. 79th Street, 80" combined sewer along E. 79th Street, NEORSD regulator at intersection of E. 79th Street and Grand Avenue, 5 fiber optic lines along NS Cleveland line, fiber optic along NS Nickel Plate line, power transmission towers parallel to NS Cleveland line, water transmission lines along Quincy Avenue (48") and Woodland (48" & 30"), and an 8" gas main along E. 79th Street.

5.2.2.1 Central Alternate A

South of Woodland Avenue, Central Alternate A is the most westerly of the three alternatives and utilizes a portion of existing Woodland Avenue for the boulevard. The proposed facility would be located west of the Kenneth Johnson Recreation Center. This alignment would create a discontinuity of existing Woodland Avenue between E. 89th Street and E. 93rd Street.

Approximately 4 residential structures and 18 commercial structures would be impacted. According to OR Colan Associates RAP Survey, Central Alternate A appears to include seven (7) residential relocations with one (1) owner occupants and six (6) tenants. There are thirteen (13) commercial businesses and four (4) landlords that are considered a business per the Uniform Act. Commercial businesses include two churches (Greater Roman Baptist Church and Faith Holiness Temple). Of the potential impacts, Kash Properties, LLC is a vehicle recycling yard and also appears to be a salvage yard is a property that may cause concern. In order to facilitate the relocation of this business, the appropriate City officials and departments would need to be contacted to determine specific zoning requirements. Estimated right-of-way acquisition and relocation costs for this alternate are $12,189,500.

The Kenneth Johnson (Woodland) Recreation Center (historic and park) is a Section 4(f) resource that could be impacted by Central Alternate A. This former public bath house is a Cleveland Landmark and was determined eligible for the National Register of Historic Places (NRHP). Impacts to the facility include widening of Woodland Avenue opposite the recreation center and 0.09 acres of permanent right-of-way along Buckeye Road from properties identified to be part of the planned recreation center expansion area.

Central Alternate A would impact approximately 60 properties with the potential for hazardous materials contamination.

Central Alternate A would require the widening of the Buckeye Road bridge and removal of the Woodland Avenue bridge over GCRTA and NS Nickelplate line. Each of which could cause temporary restrictions to rail operation. Central Alternates B & C would not impact these structures.

Central Alternate A is estimated to cost $73,200,000 in 2010 dollars. This alternate is the least expensive alternate in the Central Section.

Given the above, it is recommended that Alternate A be carried for further study in PDP Step 6.

5.2.2.2 Central Alternate B

Central Alternate B is the other alternate located west of the Kenneth Johnson Recreation Center. South of Woodland Avenue, it is located approximately two blocks east of Alternate A with geometry that would facilitate a four legged intersection at Woodland Avenue.

Approximately 8 residential structures and 18 commercial structures would be impacted. According to OR Colan Associates RAP Survey, Alternate B appears to include eleven (11) residential relocations with two (2) owner occupants and nine (9) tenants. There are twelve (12) commercial businesses and six (6) landlords that are considered a business per the Uniform Act. Commercial businesses include two churches (Greater Roman Baptist Church and Faith Holiness Temple). Of the potential impacts, Kash Properties, LLC is a vehicle recycling yard and also appears to be a salvage yard is a property that may cause concern. Their building west of E. 93rd Street would be impacted. If this requires relocation of the entire operation, the appropriate City officials and departments would need to be contacted to determine specific zoning requirements. Estimated right-of-way acquisition and relocation costs for this alternate are $12,748,000.

Two Section 4(f) resources could potentially be impacted by Central Alternate B: the Kenneth Johnson (Woodland) Recreation Center (historic property and park) and the St. Elizabeth Hungarian Church (historic). Impacts to the recreation center include widening of Woodland Avenue opposite the recreation center and 0.09 acres of permanent right-of-way acquisition along Buckeye Road from properties identified to be part of the planned recreation center expansion area. Potential impacts to the NRHP-listed St. Elizabeth Church include widening of Buckeye Road opposite from the church.

Central Alternate B would impact approximately 52 properties with the potential for hazardous materials contamination.

Central Alternate B is estimated to cost $83,500,000 in 2010 dollars. This alternate is the most expensive alternate in the Central Section, but it is only 14% higher than the lowest cost alternate, which is within the amount of contingency included in the estimates of probable construction cost.

Given the above, it is recommended that Central Alternate B be further studied in Step 6.

5.2.2.3 Central Alternate C

Central Alternate C is the most easterly of the three Central Section Alternates. Its alignment would place it east of the Kenneth Johnson Recreation Center. This alternate generally has the most difficulty interfacing with local street network due to the skew angles at which they intersect the proposed boulevard alignment. This alternate would require the relocation of E. 93rd Street and Cumberland Avenue to form a new intersection west of CSX railroad. Kennedy Avenue would be closed at CSX and removed to the west. Yeakel and Steinway Avenues may require closure to facilitate CSX bridge construction at Buckeye Road.

Approximately 14 residential structures and 10 commercial structures would be impacted. According to OR Colan Associates RAP Survey, Central Alternate C includes eighteen (18) residential relocations with nine (9) owner occupants and nine (9) tenants. There are five (5) commercial businesses and eight (8) landlords that are considered a business per the Uniform Act. Estimated right-of-way acquisition and relocation costs for this alternate are $9,917,400.

Two Section 4(f) resources could potentially be impacted by Central Alternate C: the Kenneth Johnson (Woodland) Recreation Center (historic and park) and the St. Elizabeth Hungarian Church (historic). Impacts to the recreation center include widening of Woodland Avenue opposite the recreation center and 1.57 acres of permanent right-of-way from properties identified to be part of the planned recreation center expansion area. Potential impacts to the NRHP-listed St. Elizabeth Church include widening of Buckeye Road opposite from the church, as well as possible effects due to the construction of the proposed intersection with Buckeye Road.

Central Alternate C would impact approximately 50 properties with the potential for hazardous materials contamination.

Central Alternate C is estimated to cost $79,400,000 in 2010 dollars and represents the middle of the Central Section alternatives.

Alternate C creates the most challenges with respect to accommodating the local street network and would also create the potential for additional rail impacts and costs beyond those discussed in the report necessitated by rail construction. Therefore, given that Alternate C has the highest relative impact to the Section 4(f) resource and the greatest challenges with respect to accommodating the local street network and existing rail operations, it is recommended that Central Alternate C be eliminated from further study.

5.2.3 East Geographic Section

The conceptual alternates developed for the East Section, which run along E. 105th Street from Quincy Avenue to Chester Avenue, are very similar with slight variations in alignment, and therefore have very similar impacts. All of the East alternates would widen E. 105th Street to a 5-lane, undivided typical section with two travel lanes in each direction.

Traffic operations for all intersections would operate at acceptable LOS, which is improved in comparison to the No Build traffic operation along existing E. 105th Street.

All of the East alternates would have similar environmental impacts. All alternates could impose possible impacts to NRHP-listed or NRHP-eligible sites, including Wade Park Historic District, Pentecostal Church of Christ, Park Lane Villa, and the Temple Tifereth Israel with the widening of E. 105th Street, and Cleveland Club (Tudor Arms) with the widening of Carnegie Avenue. Pentecostal Church of Christ and Cleveland Club (Tudor Arms) are also Cleveland landmark sites. No Section 4(f) park, Section 6(f), or ecological impacts are anticipated for the proposed East alternates.

Each of the alternates impacts a similar number of properties with potential hazardous materials contamination.

Each of the alternates include commercial and residential displacements within an environmental justice area. Relocations for each alternate are anticipated to impact environmental justice populations.

Substantial underground utility infrastructure exists along E. 105th Street. These include a 36" water main, 36" duct telephone bank, 8.5" gas main, 105" NEORSD interceptor sewer and up to 48 electrical ducts. These cause concern for all alternates in the East Section.

All East alternates require the widening of the existing E. 105th Street bridge over GCRTA's Redline and NS's Nickel Plate line. Temporary impacts could be created during bridge construction.

Estimated project costs for each of the three alternates range within four percent of each other.

5.2.3.1 East Alternate A

According to OR Colan Associates RAP Survey, East Alternate A appears to affect eleven (11) residential occupants with five (5) owner occupants and six (6) tenants. There are four (4) commercial businesses and one (1) landlord that are considered businesses per the Uniform Act. Alternate A results in the largest structure impact, thus resulting in a higher estimated right-of-way acquisition and relocation cost of $3,372,500.

5.2.3.2 East Alternate B

According to OR Colan Associates RAP Survey, East Alternate B would affect fourteen (14) residential occupants with three (3) owner occupants and eleven (11) tenants. There are two (2) commercial businesses and four (4) landlords that are considered a business per the Uniform Act. Although there are higher residential impacts, there are less impacts to businesses and estimated relocation cost for East Alternate B is lower than that for East Alternate A. Estimated right-of-way acquisition and relocation costs for East Alternate B are $3,138,000.

5.2.3.3 East Alternate C

According to OR Colan Associates RAP Survey, East Alternate C could affect six (6) residential occupants with one (1) owner occupants and five (5) tenants. There are two (2) commercial businesses and three (3) landlords that are considered a business per the Uniform Act. Estimated right-of-way acquisition and relocation costs for this alternate are $2,781,500, which is lower than those of East Alternates A and B.

With the exception of structure impacts, all the East Section alternates have similar impacts. Based on the lower impacts to structures, it is recommended that only East Alternate C be carried for further study in Step 6.

5.3 Step 5 Recommended Conceptual Alternatives

Based on the analysis and evaluation completed in PDP Step 5 and summarized in this *Conceptual Alternatives Study* document, four conceptual alternatives are proposed to be carried forward for further study in PDP Step 6. A brief summary of these alternatives is included in **Table 5-1**.

Table 5-1: Summary of Step 5 Recommended Conceptual Alternatives

Recommended Conceptual Alternative	Geographic Section Combination			Relocations			Traffic Capacity Concerns (LOS)	Env. Justice Impacts	Wetland Impacts	Stream Impacts	Impacts to Threatened/ Endangered Species	Hazardous Material Sites Impacted	NRHP-Listed/ NRHP-Eligible Site Effects	Cleveland Landmarks	Section 4(f) Resource Impacts	Section 6(f) Resource Impacts	Estimated Probable Cost (2010 $'s)
	West	Central	East	Residential	Business	Non-Profit (Church)											
Alternative CA1	A	A	C	71	16	2	Yes	Yes	No	No	No	118	6	3	Yes	No	$190,600,000
Alternative CA2	A	B	C	75	15	2	Yes	Yes	No	No	No	104	7	4	Yes	No	$200,900,000
Alternative CA3	C	A	C	90	16	2	No	Yes	No	No	No	115	6	3	Yes	No	$203,100,000
Alternative CA4	C	B	C	94	15	2	No	Yes	No	No	No	101	7	4	Yes	No	$213,400,000

Note: Table does not include Utility Impact and Geotechnical Concerns since this could not be determined through Step 5 analysis.